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ABSTRACT

Approximately 300 Australian users and non-users of the biomedical computerized data base, MEDLARS, were surveyed by mailed questionnaire in an attempt to determine the needs of present and potential users of the system and their prior experiences with computerized as well as other information services. Results of the survey reveal: (1) an extensive under-use of medical information systems due to a lack of awareness of their availability, (2) inadequate local library services, and (3) an inadequate interlibrary loan network. Recommendations include improvement of the interlibrary loan network, selection and adoption of a minimum core of titles as a hospital library standard, development of short term training programs for hospital librarians, and the appointment of field officers to function as disseminators of information on information services. Appended are the position paper from which the study was generated, a brief history of the development of medical information services, and the survey instrument used. (STS) are the position medical information services, and the survey instruments used. (STS) Appended are the position medical information services, and the survey instruments used. (SJS)

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THE INFORMATION NEEDS, USAGE AND ATTITUDES OF MEDICAL RESEARCHERS IN AUSTRALIA

First Report to the National Library of Australia

A Preliminary Investigation by
Carmel Maguire and Eugenia Lovelace

School of Librarianship, University of New South Wales

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Preface

The idea for this study came originally from a paper by Eugenia Lovelace on progress in assessing the information needs of biomedical researchers. That paper, which is included as Appendix I in this report, led to an investigation among biomedical researchers and teachers at the University of New South Wales (46).* That investigation suggested that information services in the biomedical field were under-used. Both lack of knowledge of available services and lack of relevance of such services to biomedical researchers' needs appeared to contribute to under-use.

Considerable activity is currently taking place in Australia in national planning for information services in science and technology. In the biomedical field new data bases, such as BA Previews, have been introduced and consideration is being given to the introduction of MEDLINE (MEDLARS on line). To the investigators a parallel investigation of the needs of users of biomedical information and of their experience to date with computerized and other information services seemed advisable, especially as Eugenia Lovelace's earlier study had pointed to under-use of existing services.

In order then to investigate user needs on a more representative sample of the total population of users of biomedical information, and in order to investigate user reaction to a computerized data base, namely MEDLARS, an approach was made to the National Library of Australia in May 1973 and a grant of $3,310 was obtained. This grant allowed Eugenia Lovelace to be employed as a research assistant in the School of Librarianship of the University of New South Wales for a period of six months between March and September, 1974.

The investigators acknowledge the generous assistance given by the National Library of Australia and in particular are grateful for the encouragement and access to relevant data given by Mr. W.D. Richardson, as Acting Director-General and as Assistant Director-General. Outstanding co-operation was also received from the staff of the Australian MEDLARS Service within the National Library of Australia.

The assistance of colleagues within the School of Librarianship of the University of New South Wales is also acknowledged and in particular Allen Hall's advice on the preparation of data for computer analysis.

Finally, thanks are due to the respondents to the very long questionnaire associated with this preliminary investigation and to the medical practitioners, other users of biomedical information and librarians who were interviewed. The generosity and interest of all the people with whom the investigators have had contact have been remarkable. We hope that this investigation may prove helpful in defining some of the information problems and in suggesting directions to be taken in the provision of the information services which the whole of Australia's health care community needs and deserves.

* Citations throughout the text and in Appendix II refer to item numbers in the bibliography which are followed by page numbers when appropriate. Citations in Appendix I refer to its own numbered bibliography.

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Section 1 Background to the Investigation

A. Introduction

Information services in medicine are highly developed in comparison to those in most other fields. Yet there have been disquieting indications and disquieted opinion that medical information services are under-used. Some of these indications and opinions have been discussed by one of the investigators in an earlier paper. A copy of this paper is included as Appendix I. In describing an information service as under-used the unspoken assumptions are that in terms of the costs of establishing and maintaining the service the actual amount of use made of it is uneconomic and that there are potential users who could benefit from using it. The investigators made these assumptions about information services in medicine, including MEDLARS, and were immediately faced with the obvious question:

> Are the existing services under-utilized because they are not providing what is needed by medical information users; or, are prospective users unaware of their own needs and of the sources available to satisfy those needs?

Before proceeding with their own survey the investigators pursued answers to both parts of this question in reports of overseas services and studies and in data made available by the National Library of Australia from the Scientific and Technological Information Services Enquiry Committee (STISEC) and from the Australian MEDLARS Service.

Much of the information gathered on overseas services and studies, and in particular on the operations of and innovations in the Regional Medical Library Programs (RMLP) in the United States, has been summarized in Appendix II: Trends in Medical Information Services. The information presented points to affirmative answers to both parts of the question posed above. But the indications are diffuse and evidence bearing more directly on the question seemed likely to arise from comparative study of some aspects of the operations of MEDLARS in the United States, United Kingdom and Australia.

B. Some MEDLARS Experience in the United States, United Kingdom and Australia.

(i) Origins of MEDLARS

MEDLARS became operational in January 1964 and the National Library of Medicine set out its objectives in introducing the computerized system as follows:-

> "(1) to improve the quality of, and reduce the time needed to prepare the monthly index to current articles; (2) index journal articles in more depth; (3) prepare literature searches in specialized fields; and (4) provide rapid retrieval of citations from the literature files." (81:11)

Thus the MEDLARS data base was created primarily to improve the quality and timeliness of Index Medicus. The "MEDLARS Service", in the sense of supplying demand and current awareness searches, was the last objective considered. Since the computer facilities involved a sequential-access storage and retrieval system, demand searches occupied 40% of computer time even though they accounted for only 21% of the computer's output. (81:15) From the user's point of view sequential-access meant a delay of anything from two to four weeks for the search to be processed.

On the quality of the MEDLARS search output Lancaster's 1968 evaluation concluded that approximately 50.4% of all citations retrieved were relevant with an overall recall ratio of 57%. (38:41) As a result of Lancaster's recommendations the National Library of Medicine set up and has maintained a Quality Control Unit. The MEDLARS II system also features random access to the files thus allowing more rapid searching. (81:27)

(ii) Volume of Use

In the first year of MEDLARS operation 586 searches were run; by 1970 this volume had increased to 20,700 of which 3,600 were run at the National Library of Medicine, 10,700 in Regional Centers in the United States and 6,400 at Foreign Centers. (81:13) From the point of view of comparisons with the Australian MEDLARS Service it is interesting to look at statistics of the Regional Centers with comparable populations of medical practitioners.

The Denison Memorial Library of the University of Colorado Medical Center is the MEDLARS Center for Region VIII - Midcontinental, of which in 1969 the physician population was 16,067. Between October 1969 and April 1972 the Colorado Center released 2,158 Demand Searches and 429 Recurring Searches. For this period of 2½ years the average over all Regional MEDLARS Centers was 2,682 Demand Searches and 811.9 Recurring Searches. (26:9)

The number of resident, registered and active medical practitioners in Australia was 17,962 at 30 June 1972 according to information received from an officer of the Health Commission of New South Wales. For a period of 2½ years, that is, for a similar period to that covered by the Colorado figures, from January 1971 to June 1973 the Australian MEDLARS Service released approximately 3,748 Demand Searches as well as 535 Recurring Searches, although the latter service only became operational in December 1971.

It seems then that Australian usage of the Demand and Recurring Search services of MEDLARS compares favourably with that of average usage in the United States and with that of a Region of comparable population in terms of medical practitioners.*

* The investigators have deliberately omitted at this stage any reference to the effect on volume of use of the availability of MEDLINE in the United States and of the likely effect of its introduction in Australia.

(iii) Quality of Output

Since January 1969 the Quality Control Unit of the National Library of Medicine has analysed the returned Appraisal Forms, one of which is sent out with every Demand Search released. The same practice is followed by the Australian MEDLARS Service so some comparisons are possible. For the period January 1969 to June 1970 the N.L.M's Quality Control Unit received Appraisal Forms from 5,157 users: this represented a return rate of 24.4%. The average number of citations per search was 176: 55% of these were judged relevant and 47.9% of them were new to the user. Of the users, 23.9% reported relevant citations missed in the search but 70.6% of users reported a recall of 50% or higher. (31)

The Australian MEDLARS Service for the period August 1971 to February 1973 received 440 Appraisal Forms: this represented a return rate of approximately 19%. The average number of citations per search was 179 and 49.8% of these were judged relevant or peripherally relevant by users. On an average Australian users found that 66.8% of all relevant citations and 80.9% of all peripherally relevant were new to them. In 144 of the searches recall (judged by the user's previous knowledge of existing citations) was estimated at 100%; in 31 searches at between 90-99%; in 20 searches at between 80-89%; in 35 searches at between 50-79%; in 18 searches between 10-49% and in 26 searches at between 0-9%.

Both the National Library of Medicine's and the Australian MEDLARS Service's statistics are similar to Lancaster's original findings. For 299 searches he found that 50.4% of citations were relevant with an overall recall ratio of 57.7%. (Lancaster's recall ratio was based on a comparison of MEDLARS output with a manual search of the literature.) (38:41) The similarity of all these figures suggests that the MEDLARS Service as a whole functions consistently and that estimates of relevance and recall are reliable measures. There are however many important questions about any information service for which statistics like these provide no answers. For example,

1. Is the service functioning to its full capacity?

   a) could the service, as it exists, be useful to non-users?

   b) is the service, as it exists, being used in the most effective way or ways by users?

2. In terms of $ costs is the service worth providing granted other services that have to be foregone to finance it?

3. In what areas is the service not useful?

4. Are relevance/recall ratios, though apparently consistent measures, necessarily valid measures of relevance and recall? May estimates of relevance, for example, be subjective opinions held by an atypical minority of the users of medical literature about the machine's ability to match terms?

Data are available on the subjects of MEDLARS searches and on the environments in which and the purposes for which MEDLARS is used. By studying them at least a firmer basis for considering the above questions may be laid.

(iv) Type of Use

For his evaluation of MEDLARS Lancaster selected 21 user groups to be representative of the type of user environment, subject categories and probable modes of user/system interaction encountered in requests received at the National Library of Medicine throughout 1965. He estimated that the break-down of subject areas shown in Table 1 below was representative of MEDLARS searches in general. (38:13)

Disease	34.6%
Pre-clinical Sciences	18.3%
Technics	14%
Drug/Biology	11.4%
Drug and Chemical	7.7%
Behavioural Science	5.5%
Public Health	3.4%
Physics/Biology	2.9%
Drug/Disease	2.9%

Table 1. Subject areas of MEDLARS search requests received at National Library of Medicine, 1965.

The searches which Lancaster analyzed fully came from users in the types of environments and in the proportions shown in Table 2 below. (38:34)

Academic	147
Research	70
Clinical	56
Federal Regulatory	11
Pharmaceutical	9
Private Practice	6

Table 2. User-categories of MEDLARS search requests analyzed by Lancaster.

For all categories of users, Lancaster's data indicate that "Disease" and "Pre-clinical Sciences" represented the main subject areas in which searches were requested. (38:34)

In analyzing causes of recall/precision (i.e. relevance) failures Lancaster concluded that indexing policy or error was responsible for 37.4% of recall failures and 12.9% of precision failures. Search formulation accounted for 35.5% of recall failures and 32.4% of precision failures. (38:42 & 43) He makes the point that since recall and precision have an inverse relationship the search formulation has to be a compromise between these two demands.

In a study made of the use of MEDLARS at the University of Michigan this point was particularly examined. (79) Questionnaires were sent to users of the service in the 1971-72 period and 168 replies were received. There was found to be a significant, positive correlation between the size of the bibliography received (not the percentage of relevant items) and the level of user satisfaction. It was also found that the level of satisfaction correlated positively with the academic status of the user. Practitioners engaged solely in clinical work expressed a lower degree of satisfaction than did those also engaged in teaching and research. In this study however, the difference was not found to be statistically significant. "Research" was the most frequently cited reason for having submitted a search-request. The author comments:

> "In conclusion, it seems that the MEDLARS bibliographic service, at the stage we investigated it, was more heavily used in the pursuit of knowledge than in helping to apply that knowledge to the delivery of health care. Whether this was due to situational factors (the heavy concentration of researchers and educators in the immediate surroundings of the service, their familiarity with the library set-up, their habits of relying on printed matters for their information needs) or was due to the fact that MEDLARS design lends itself better to answer the information needs of scientists than of practitioners is a matter worthy of intensive study. A much larger data base will have to be secured to investigate the utilization of MEDLARS bibliographic service by professionals and the impact this source of biomedical information has on the practice of medicine and allied fields." (79:176)

Data from a United Kingdom study also indicate that most MEDLARS usage is by researchers and educators. The University of Newcastle-Upon-Tyne began processing MEDLARS searches in May 1966 and some data on the use of the service up to June 1968 have been analyzed by M. King (34). The categories of users in the Newcastle Region and the proportions of searches which came from them are shown in Table 3 below. (34:10)

Hospital	57.6%
University	33.3%
Industrial and Research Organizations	2.0%
Medical Research Council Units	2.7%
Other	4.4%

Table 3. User categories of MEDLARS search requests analyzed at University of Newcastle-Upon-Tyne, 1966-68.

In November 1967 formal efforts were made to publicize the MEDLARS service throughout the Newcastle Hospital Board Area, and in each main local hospital a clinical tutor was used as the main channel of publicity. This factor may partly account for the high usage by hospital staff. King looked more closely at this usage, however, and

reported that 62% of the users were at Senior Registrar level or higher (34:14), and also that the most common reasons given for requesting a MEDLARS search were:

1. General background information.

2. Further references to complete a bibliography.

3. To see whether any previous work had been done. (34:22)

These are obviously not requests directly related to patient care. Their nature accords with the finding that most users wanted as comprehensive a search as possible and, despite relevance ratios ranging from 35.8% to 27.3%, reported that they would not wish to scan fewer references at the risk of missing some that might be relevant. (34:36) The subject areas of the Newcastle searches King studied fell into proportionate groups very similar to those reported by Lancaster. (34:20)

Figures available from the Australian MEDLARS Service on the distribution of demand searches for the period January 1971 to June 1973 list only the four main categories of users and are shown in Table 4 below.

Tertiary	1469
Hospital	705
Government	537
Research Institutes*	29
*(Only three institutes are separately listed as such and figures kept individually for them)	

Table 4. User categories and numbers of MEDLARS demand search requests received at National Library of Australia, January 1971-June 1973.

Despite the limitations of these figures for demand searches the trend is clear and it is confirmed by the more complete figures available for the current awareness or selective dissemination of information (SDI) searches given in Table 5 below.

Tertiary	53%
Hospital	21%
Government	16%
Research institute) Medical society)	4%
Private practice	3%
Other	3%

Table 5. User categories of MEDLARS SDI search requests received at National Library of Australia, January 1971-June 1973.

In February 1974 the Australian MEDLARS Service distributed questionnaires to SDI search users. Despite an average relevance ratio of 53% ± 10%, approximately 87% of users reported they were satisfied. Even 23 of the 37 users getting less than 20% relevance still professed themselves satisfied with the service. The questionnaire also asked users about some of their other information seeking habits and the results are comparable with responses received in the King survey at Newcastle-Upon-Tyne. To facilitate comparison aspects of these results have been combined in Tables 6 and 7 below, even though the bases of comparison are not identical.

United Kingdom (N=79)		Australia (N=107)	
0	1.3%	(0 option not offered Australian users)	
1-4	12.7%	1-3	2.7%
5-9	43.0%	4-9	24.2%
10-19	29.1%	10-19	32.7%
20-29	7.6%	20-29	19.6%
30-49	3.8%	30.49	13.0%
50 or more	2.5%	50 or more	7.4%

Table 6. - Numbers of journals regularly scanned by MEDLARS users in the United Kingdom and Australia. (U.K. data derived from King's study. (34:17))

	United Kingdom (N=47)	Australia (N=144)
Scanning journals regularly	96%	68%
Personal communication		
1. From specialists	25%	
2. From colleague or assistant	21%	55%

Table 7. Methods used for keeping up to date by MEDLARS users in the United Kingdom and Australia. (U.K. data derived from King's study. (34:16))

37% of the Australian MEDLARS SDI users reported that they regularly consulted printed indexes and abstracts and 56% that they regularly consulted Current Contents which was listed in a separate category. In the King survey Current Contents was included among printed indexes and abstracts, a category which 66% of U.K. respondents reported they used regularly.

As has been said the bases of comparison are not strictly identical, however, it does appear that in both cases a considerable number of journals are scanned and that abstracts and indexes tend to be consulted regularly, even though the respondents are also recipients of a MEDLARS search.

(v) The MEDLARS User

Attempts to analyse surveys of MEDLARS use are fraught with frustrations. Apart from Lancaster's evaluation (38), the reports we have cited are based on small samples. Typically neither the type of data collected nor the methods of collection and analysis are strictly comparable. Despite there barriers to cumulation of information about MEDLARS use and users, however, at least the outline of a composite picture of the MEDLARS user does begin to emerge. The MEDLARS user is very likely to be a person engaged in research working in an academic environment and accustomed to scanning a considerable body of literature. This outline is at least corroborated if not fleshed out by the findings of the preliminary study conducted by the investigators and reported in Section II below. But before proceeding to those results and to help place them in context, some of the data gathered by STISEC on the characteristics of respondents in New South Wales who gave Medicine as their basic discipline are inspected below.

C. STISEC data on medical information users.

New South Wales respondents in the field of medicine reported to STISEC that they scanned regularly the numbers of journals shown in Table 8 below.

No. of journals	% of users
1-2	24%
3-5	51%
5-10	14%
10+	11%

Table 8. Number of journals reported to STISEC regularly scanned by New South Wales respondents in medicine.

Respondents do not appear to have noticed the overlapping categories inadvertently presented to them by the STISEC questionnaire. The fact that 75% of the respondents report scanning 5 or fewer journals regularly is in marked contrast to the data on both Australian and United Kingdom users of MEDLARS as presented in Tables 6 and 7 above.

Only 14% of respondents reported that they consulted abstracting and indexing journals "frequently" (which was defined as at least once a month) and 43% reported that they did not consult them at all. 78% of the group, however, reported that they consulted scientific and technical journals frequently and no respondents reported that they lacked access to them. 8% of the sample reported that abstracting and indexing journals were not available to them and a similar percentage reported that they had no access to current awareness bulletins. 35% said that they could not obtain literature searches when they needed them. Needless to say, these respondents who believed that abstracting and indexing journals, current awareness bulletins and literature searches were unavailable to them can hardly have been aware of the services the MEDLARS data base can provide.

But other findings suggest that awareness of MEDLARS or any other literature based service is by no means likely to be a universal remedy to medical information problems. The major reason given to STISEC by New South Wales respondents in medicine for not using abstracting and indexing journals and current awareness bulletins was that they considered them "not relevant". 29% reported this about abstracting and indexing journals and 35% about current awareness bulletins30% of the sample considered review journals "not relevant" as a source of scientific and technical information and 27% felt the same way about conference reports. Personal correspondence was a resort of only 13% of the sample "frequently", of 28% "occasionally" (defined as about twice a year) and of 24% "hardly ever" (defined as less than once a year). 12% considered personal correspondence not relevant as a source of information. The corresponding figures for conference attendance were 29% frequently, 45% occasionally, 11% hardly ever and 2% not relevant.

Apart from journals the most frequently used source of information reported by STISEC's sample of New South Wales information users in medicine was the category monographs/textbooks which 60% reported using frequently and 30% occasionally. Next in popularity were the reports of the user's own organization, trade literature, and pamphlets. These three sources have two features in common:

1. they contain information which can be immediately applied in a working situation; and,

2. they are likely to be available within the physical working ambit of the practitioner: the textbook is on the shelves of his room; the trade literature arrives on his desk through the mail.

Such information is therefore readily accessible for use; it is however not necessarily the most up-to-date or broadly-based information available.

D. Formulation of objectives of preliminary survey.

Evidence examined to this point seems to indicate that existing information services in medicine are under-used and that positive answers may have to be given to both parts of the question raised at the beginning of this Section: existing services do not always seem capable of providing appropriate responses to information needs and potential users seem neither sufficiently aware of their own needs nor of the services available to satisfy them.

Anxious to gain deeper insights into these problems, the investigators decided that one profitable approach might be to find out whether there are characteristics which differentiate medical researchers who use the MEDLARS service from those who do not. The investigators also felt that at the same time a study of the use made of MEDLARS might be designed to reveal characteristics of the service which could be affecting the nature and extent of usage.

The first line of investigation led immediately to the problem of differentiating "the medical researcher". Any attempt to limit such a description to those entirely or mainly engaged in medical research soon breaks down. Medicine is an innovative discipline and every member of it needs to be alert to new developments and will need to make deliberate searches for information on particular problems as they arise. For the purposes of a study of information needs, usage and attitudes, there seemed to the investigators no alternative to regarding any registered medical practitioner as a medical research worker.

What the investigators were setting out to do then was to compile information profiles of users and non-users of MEDLARS which would hopefully yield data which would distinguish the two groups in important ways. The concept of the "information profile" includes for the investigators levels of information consciousness of individuals as evidenced in the nature and extent of the activities by which they seek, process and disseminate information. The objective was also to match these profiles individually and collectively with the available information services, particularly but by no means exclusively with MEDLARS.

The research problem having been thus identified, work could proceed on the identification of aims and methods of the preliminary investigation.

Section II The Survey

A. Aims and methods

(i) Aims

The aims of the preliminary investigation were to design and test a method by which the information sources and services used by Australian medical researchers might be elicited and to identify also those sources and services not used along with reasons for non-use or under-use. To this end and to build up information profiles for comparison, especially of users and non-users of MEDLARS, data had to be sought about individuals' main areas of activity, main areas of information need, number of publications, professional affiliations and attendances at conferences, as well as how they actually went about satisfying their information needs.

(ii) Choice of Method

A questionnaire sent out by mail is obviously a practical method of gathering a large amount of data from a number of individuals in a relatively short time and in a form which can readily be analyzed. The drawbacks of this method are also obvious. A response rate of 100% is most unlikely; bias is likely to occur since the person completing the questionnaire may be tempted to supply answers which give an enhanced account of his behaviour; and the questionnaire may entirely miss the more subtle points and shades of meaning which underlie apparently unequivocal responses. Yet alternative methods for collecting data on the behaviour and attitudes of information users, such as interviews, diary-keeping, and so on, were impractical in view of the time frame in which this preliminary investigation had to be carried out.

The investigators therefore decided to use a mail questionnaire and to try to minimize the weaknesses of the method in a number of ways. The letter to accompany the questionnaire was carefully composed in the hope of gaining cooperation. (See Appendix III). A reminder letter was also carefully drafted. (See Appendix IV). Questions were designed as far as possible to minimize opportunities for generalized answers subject to either the vagaries of memory or the temptations of self-enhancement. The results of these efforts may be gauged from the survey response rate and the analysis of the questionnaire given below.

The investigators also decided to conduct a number of personal interviews with users of the MEDLARS service. The purpose was partly to seek corroboration of aspects of the data received on completed questionnaires and partly to test whether insights and hints of information problems might be gained by this method which might be examined more fully in any subsequent study, perhaps by modifying the preliminary questionnaire to include them. Owing to exigencies of time, only 11 interviews were in fact conducted. The

insights gained tended in general to corroborate data received on completed questionnaires. The usefulness of the interviews, particularly in revealing attitudes of MEDLARS users to search formulations, is discussed in Section II B of this report along with the rest of the findings of the preliminary investigation.

(iii) The Sample

The aims of the investigation really called for two samples, one of users of the MEDLARS Service and one of non-users. For the sake of brevity these two groups will hereinafter be referred to as M and Non-M.

The M sample was drawn from users of MEDLARS in New South Wales whom the Australian MEDLARS Service identified and to whom the Service sent a letter seeking agreement to participate in the investigation. (See Appendix V). The names of MEDLARS users willing to cooperate were sent to the investigators.* Of these 150 were chosen, 128 to receive mail questionnaires and 22 others with the intention of seeking personal interviews with them. Another division was introduced into the M sample. Those who used the SDI service were separated from those who used only the Retrospective Search service. Again for brevity these groups are subsequently referred to as M-SDI and M-Retro.

The Non-M sample was drawn, with the assistance of a table of random numbers, from the alphabetical list of registered medical practitioners in the latest published edition, the 1972 edition, of the Medical Directory of Australia. In choosing 150 names two criteria were observed. The chosen individuals had to be resident in New South Wales and, as far as the investigators could be aware, not users of MEDLARS.

(iv) Mailing and response

Questionnaires were mailed as follows:

11 July	---	150 to Non-M sample
16 July	---	70 to M-Retro sample 58 to M-SDI sample

Reminder letters were mailed as follows:-

29 July	---	113 to Non-M sample 52 to M-Retro 29 to M-SDI

* Not all MEDLARS users are medical practitioners and respondents from the M sample included 12 individuals whose specialities included veterinary science, psychology, biology, zoology and occupational therapy.. Their replies have been included in the results: as 6 of them were working in medical teams, they can have introduced little bias and their experiences with the service were often illuminating.

13 August was chosen as the cut-off date for replies. To that date replies had been received from 37 of the Non-M sample (25%) and from 40 M-Retro (57%) and 37 M-SDI (64%).*

The number of questionnaires returned in time for processing was disappointingly low, even though from a percentage point of view this response rate does not appear to compare unfavourably with that attained by similar surveys.

Many causes can be suggested for the low response rate from the Non-M sample: for example, the bulk of the questionnaire, the coincidence of a postal strike and a flu epidemic. The 1972 Medical Directory is obviously out of date for many addresses. Some of those who did not complete the questionnaire explained that they had retired from practice; one person wrote to advise that he would accept only questionnaires sent through his professional body, the General Practitioner's Society. Among the implications are that any future survey ought to be accompanied by a public relations exercise in conjunction with the professional societies, to gain cooperation and to allay apprehensions about the survey's purpose. Obviously respondents should also be given plenty of time to reply to a complicated set of questions, and possibly the time allowed should be punctuated with a second reminder letter.

Not all respondents answered all questions and a "no reply" category has been included for these in the discussion of results in Section II B and in the Appendices. The distribution of these blanks in returned questionnaires appears to indicate careless reading and perhaps impatience with the task of replying rather than factors which could cast doubt on the validity of the rest of the responses from the individuals concerned. These failures to reply to particular questions point up the importance in a full scale survey of using letterpress or photoreduction to reduce the overall bulk and spread of the questionnaire.

Because of the small numbers of responses represented in the findings of the investigation, percentages will not be used. With 37 Non-M, 37 M-SDI and 40 M-Retro, percentages could very easily give a distorted picture whereas reporting of the number of individuals in each case helps keep the scope and generalizability of the findings in proportion.

* Completed questionnaires have continued to arrive spasmodically since the cut-off date. The response to date from the Non-M sample has been 45%. This includes 8 late returns, 15 individuals no longer at the addresses to which questionnaires were directed, and 7 who returned the questionnaires uncompleted for a variety of reasons. The response to date from the M sample has been 67% for M-Retro and 72% for M- SDI.

(v) The questionnaire in general

The core questionnaire was designed to be appropriate to both M and Non-M respondents. For ease of consultation, however, Non-M responses have been presented on a copy of the questionnaire in Appendix VI A and M responses are similarly presented in Appendix VI B.

In the core questionnaire two versions of Questions 3, 22 and 23 were devised. The information sought (namely the activities in which respondents were engaged, the processes which they had followed in their most recent deliberate search for information, and their rating of the success of their information-seeking behaviour) was the same. The purpose of the two versions of these questions, differentiated as A and B in the Appendices, was to see whether one form would elicit information better than the other.

For the M sample a section was added to the questionnaire designed specifically to elicit information on their use of MEDLARS. Wording of questions in this section was varied slightly according to whether they were intended for M-Retro or M-SDI. Again basically the same information was being sought and the two versions are appropriately designated in Appendix VI B.

A detailed discussion of the efficacy of particular questions and versions of questions as instruments of data collection is given in the next Section.

(vi) Particular aspects of the questionnaire

Work activities. Question 3 was concerned with finding out how much time respondents spent on various professional activities. Two versions were designed; The "A" version was shorter and more general. It read:

> Can you rank the following activities according to the amount of time you generally devote to them. (Please rank: 1 = rarely; 2 = some; 3 = often; 4 = a lot).
>
> Administration .... [ ]
>
> Direct patient care .... [ ]
>
> Research .... [ ]
>
> Teaching .... [ ]
>
> Other (Please specify) ....
>
> ....

The "A" version was sent to half the Non-M sample and to all M-SDI.

The "B" version of this question was longer; it offered 13 categories of work and frequency was sought in terms of hours per week. This version was based on a table used by I. Fett and reported in her article "Australian Medical Graduates in 1972" (Medical Journal of Australia, 1, 4 May 1974: 689-698) and it was tried in an attempt to establish whether a vocabulary closer to that used by medical practitioners in describing their activities might get better results. The "B" version was as follows:

Can you estimate the amount of time per week that you generally spend on the following activities: (Please tick one or more as appropriate)

	Less than 15 hrs per week	15-30 hrs per week	Over 30 hrs per week
Honorary hospital work			
Non-resident salaried hospital work			
Resident hospital work			
General Practice (group)			
General Practice (individual)			
Specialist Practice (group)			
Specialist Practice (individual)			
Clinical teaching and research			
Non-clinical teaching			
Non-clinical research			
Government and Public Service			
Other medical work			
Administration			

The "B" version was sent to half the Non-M sample and to all M-Retro.

Each version was completed by 57 respondents. In a full-scale survey the more detailed breakdown of activities elicited by version "B" could be very helpful and its length does not appear to affect the response rate of medical practitioners. M-Retro who were not medical practitioners naturally had difficulties in fitting their activities into the categories provided, and tended to say so. On the other hand the non-medical practitioners among the M-SDI respondents expressed no such difficulties with the shorter "A" version. With the very small numbers of non-medical practitioners in this survey no firm conclusions can be drawn from these results, except perhaps that any future survey of MEDLARS users should provide opportunity for such respondents to describe their work activities.

Information-gathering behaviour. Both versions of question 22 attempted to discover patterns of information-gathering behaviour by using the critical incident technique. This technique requires the respondent to give details about a particular event rather than to generalize about his experiences. Information supplied about a critical incident is likely to be more accurate taken over a large number of cases. The particular event described by an individual may be atypical, but if a sufficient number of instances are collected the total response should reveal an accurate picture of behaviour patterns.

The critical incident chosen by the investigators was the latest occasion on which the respondent had engaged in a deliberate search for information. Two versions of question 22 were framed asking respondents how they had gone about their latest searches. The shorter "A" version left it open to the respondent to describe the process; this version was sent to half the Non-M sample. In the longer "B" version several steps were set out for the respondent to complete; this version was sent to the other half of the Non-M sample. This question was not included in the questionnaire for the M sample because it would have added to their already lengthy assignment.

There were 17 Non-M responses from those who received version "A" and 20 from those who received version "B". Again the small numbers make definite judgment on the relative merits of the two versions impossible. The open version "A", however, tended to bring forth more information as respondents explained in their own words the sequence of their searches. In the structured version "B", where respondents were asked to state where they started to search, responses tended to be less informative; they tended to write simply "library" or "own collection". 2 respondents faced with version "B" did not attempt the questions although their answers were otherwise complete. 2 others who claimed they could not recall their latest search may have said so in order to avoid completing the question. 4 out of 20 represents a 20% failure rate which could not be risked in a full-scale survey.

The failure of version "B" does not however imply success of version "A". In a few cases the open version elicited very good information but in some others the information was as limited as that provided by the structured version of the question. In the

view of the investigators neither version of this question was satisfactory and in any broader survey a re-wording would be necessary. Perhaps the best approach would be to give a structured version of the question, with the structure based on that underlying the "good answers" to version "A" in the preliminary investigation.

Degrees of success in information-gathering. Two versions were prepared of Question 29; both were attempts to gain insights into degrees of success in information-gathering. Version "A", sent to all the M sample and half of the Non-M sample, read:

> Can you give any recent examples of information, of whatever kind, which you tried and failed to obtain?

Version "B", sent to the other half of the Non-M sample and appearing immediately after the structured critical incident version of Question 22 discussed above, read:

> Do you feel that the time involved in finding the information caused you to be satisfied with less than you would *ideally* have liked?

Version "A" was returned by 94 respondents, 40 of them left it blank and 22 wrote "No". One lesson seems to be that it is poor policy to ask negative questions. Yet the information gained from the 32 respondents who offered instances of failure proved valuable and their responses are discussed in Section II B. This is another instance where a positive re-wording, based on the structure of the "good answers", might yield a successful item for any subsequent questionnaire.

Version "B" was returned by 20 respondents, 7 of them left it blank, 9 wrote "No", 1 was undecided and 3 wrote "Yes". This version of the question can only be rated a failure.

The concept of relevance. Since MEDLARS users are repeatedly asked to give estimates of the percentage of relevant items retrieved in searches and because relevance ratios are one of the accepted criteria for evaluating information services, it seemed desirable to attempt to gain some insight into our M sample's concepts of "relevance". It was decided that the diagrammatic representation given by Tefko Saracevic in "The Concept of Relevance" in *Introduction to Information Science* (New York, Bowker, 1970, p. 121) might be a successful tool. Saracevic's permission to use the diagram was sought and kindly granted. (See Appendix VI B Question 28).

This question was experimental; its format is a radical departure from that usual in questionnaires. It elicited a few exclamations from respondents, such as "Phew!", "We may not be on the same wave-length here", and "This is crazy". Yet all but 4 respondents took the trouble to complete it and it elicited the information sought. Despite the shock of its appearance on the questionnaire, or maybe because of it, the relevance diagram was a success. The substance of the results of it will be discussed in Section II B.

In other areas the technical quality of the questions cannot be assessed separately from the data they gathered. All cases, other than those already assessed, where the phrasing of questions may have affected the validity of replies, will be noted in the following sections in which the findings of the preliminary survey are discussed.

B. Survey findings

Detailed results are not reported for each item on the questionnaire: only those items which led to worthwhile comment or suggested conclusions are discussed below. Full results are reported in Appendices VI A and VI B.

(i) Information needs and information sources

The first item in the questionnaire asked all respondents to rate the quality of the information services available to them. The pattern of response is given in Table 9 below.

	M (N = 77)	Non-M (N = 37)
Excellent	14	5
Above average	27	8
Adequate	27	14
Less than adequate	7	7
Poor	1	1
Did not reply	1	2

Table 9. Opinions of available information services.

One of the M-Retro respondents found it necessary to add another category, "Better than adequate", which was coded as "above average".

The replies to this question immediately suggest a difference between users and non-users of MEDLARS. It is of course hardly surprising that the M respondents have a higher opinion of the information services available to them. MEDLARS itself is a sophisticated information service. Furthermore, 33 of the M respondents were in a university or other institution of tertiary education and 11 were in research institutes, whereas only 5 of the Non-M respondents were in a university or other tertiary institution and 3 were in research institutes. In such settings library facilities can be expected to be of reasonable to high standard.

Contrast also appears in the activities in which M and Non-M respondents are mainly engaged. Of the 37 M-SDI respondents to Version "A" of Question 3, 20 reported that they spent "a lot of time" on research: none of the 20 Non-M respondents reported doing so. On the other hand, only 4 of the 37 M-SDI respondents reported spending "a lot of time" on direct patient care whereas 16 of the 20 Non-M respondents reported doing so.

A similar picture emerged in answers to Version "B" of the same question wherein respondents were asked to give the number of hours per week spent on various activities. For example, only 6 of the

17 Non-M respondents reported spending any time on clinical research and teaching compared with 30 of the 40 M-Retro respondents who did so.

Naturally this contrast is mirrored in the information needs of the two groups. Non-M respondents needed information most frequently for their own general awareness and next for direct patient care. M respondents needed information most frequently for their own research and next for general awareness.

Already the rough outlines of profiles of the two groups begin to emerge. The non-user of MEDLARS considers the information services available to him adequate, is generally in private practice or working in a hospital, spends most of his time on direct patient care and requires information mostly for general awareness and next for direct patient care. The MEDLARS user considers the information services available to him above average, works in a tertiary institution, a research institute or a hospital, spends most of his time on research or teaching or a combination of both, and requires information mostly for his own research and next for general awareness.

More contrast is suggested by the frequency with which the two groups of respondents reported using channels of information. Details on use of channels can be studied in Question 5 in Appendices VI A and VI B. In general it appears that, for Non-M, talking to colleagues was the most frequently used channel, followed by use of their own collections of information and then use of a library. M respondents, on the other hand, reported most frequently using a library, followed by their own collections and then talking to colleagues.

The investigators had feared that respondents might resent filling in a table as complex as that presented to them in Question 5. In fact not a single person left it unanswered. The results suggest that it is a successful questionnaire item which could yield valuable data over a large sample. It is somewhat tantalizing to have so few replies that elaboration of the results is not worthwhile and that only the most guarded suggestions can be made about implications. Is it true, for instance, as the figures given in Appendices VI A and VI suggest, that the M group is more likely to consult a librarian than the Non-M?

The only channels of information given by respondents, in addition to those suggested to them in Question 5, were two reports each of MEDLARS and of abstracting journals. Some pains were taken in wording the Question to include a category described as "a service which alerts you to items in the literature that are likely to be of interest to you". This was obviously misinterpreted by at least the 4 respondents mentioned above and needs re-working, possibly with the additions of MEDLARS and abstracting journals as examples.

(ii) <u>Factors influencing use of services</u>

Question 15 began as follows:

Q 15. The following are examples of some of the information services available in medicine:

A. Tape and cassette loan-services of the Post-Graduate Committees in Medicine of the various universities.

B. Radio broadcast services of the Post-Graduate Committees in Medicine of the various universities.

* C. Land Line Network of the Post-Graduate Committee in Medicine (University of Sydney).

D. MEDLARS.

E. Other computerized information services, for example, BA Previews, I.S.I. services etc.

Respondents were then asked to indicate whether they used the services and to indicate factors that had influenced this. Most of the services were never used with the self-evident exception of course of M users use of MEDLARS. The figures for the few who claimed to use "Other computerized services" should be regarded with caution: some respondents indicated that they included Current Contents and the Excerpta Medica abstracting series in this category. The full responses are presented in Appendices VI A and VI B Questions 15 and 16.

The main reason given for not using computerized services was lack of publicity - 18 Non-M and 42 M - followed by the feeling that the services would not be of any use and only a few respondents finding them inconvenient to use. Fewer M users, however, felt that such services would not be of any use and none felt that they would be inconvenient to use, or that the time taken between contacting such services and receiving the information would be too long. This suggests that the MEDLARS service is found sufficiently satisfactory to encourage users to look more favourably upon similar information services.

The MEDLARS service was "sometimes" used by 35 M respondents, 15 "often use" it, 13 used it "a lot" and 12 "rarely use" it.** Not a single M respondent found the service inconvenient to use and none felt that it was of no use. 5 felt that their use of the service had been affected by lack of publicity about what the service offers and how they could get to use it. Only 3 felt that the time involved was a negative factor influencing their usage.

Non-use of tape and cassette services, radio broadcast services and Land Line Network appeared to be influenced by lack of publicity

* A telephone-circuit service relaying taped and live talks, seminars etc. on a variety of medical subjects. Cost of the extra telephone line is borne by the user.

** 2 respondents did not complete the item.

and the feeling that the service would not be of any use: the former may of course be the cause of the latter. Another major factor is that these services are considered to be inconvenient to use. Proportionately, fewer M users than Non-M considered the other services to be inconvenient to use, but more M than Non-M felt that they would not be of any use. The latter opinion may be because the other services are less designed to satisfy research needs (M users' main activity), or because the MEDLARS service satisfies their needs. The former opinion however raises questions which are worth investigating: Is the M user the personality type that is prepared to go to some effort to satisfy his information-needs? or, Does familiarity with using information services convince users that they are not, in fact, generally inconvenient to use?

The investigators are prepared to hazard the suggestion that the respondents who find the various services "inconvenient to use" in fact mean that they are inconvenient to contact: which really comes back to lack of publicity, which may well also be the factor most influencing those who consider that the services would not be of any use.

The service which is found the most inconvenient to use, which is used least and which is considered to be of the least use is the Land Line Network. This one in fact offers immediate, up-to-date information available in the practitioners own surgery or hospital. There is however the limiting factor of the cost of a telephone conversation for the individual and the inconvenience of arranging it once he has managed to discover that the service exists. For the person working in a hospital the inconvenience lies again in discovering that the service exists, and then in discovering where the connected telephone is located. This is not a facetious exaggeration: in conversation one member of a large Sydney hospital expressed awareness of the service, but he had been frustrated in his one attempt to use it because no one knew the location of the connected telephone. Most of his colleagues in the hospital were unaware of the existence of the Network. Thus, again it is locating and contacting, rather than using, the service that is inconvenient.

The various comments supplied enhance this impression and the selection given below may convey some idea of the lack of awareness of existing services more forcefully, and certainly more colourfully, than a mere figure giving the number of responses.

For example:-

Hospital Staff member	- "What are MEDLARS?"
General Practitioner	- "What the hell is MEDLARS? Never heard of group E.* There is too much information floating around and after my day's work I want time to live for myself and my family - so, politely, the hell with it all!"
Hospital/University	- "As far as I am aware none of these relate to surgery."

* [i.e. Other computerized information services.]

General Practitioner - "What is this?" about MEDLARS

and comments: "I have no idea how one goes about finding information of a current nature, apart from what I read in current textbooks and happen to fortuitously read in one of the journals I receive. 1. If there is any other way, please advise me, as I would love to know." 2.

University member - "I use Index Medicus which provides all that could be required. The other sources are all rehashes."

Health Commission - "I believe that D & E * might be very valuable to me but I have never known how to contact them."

Hospital/Specialist Practice - "Most of the above are not available in country areas. I am not familiar with D & E * above."

Specialist Practice - "The lack of use is very greatly due to lack of knowledge of facilities and programmes available."

General Practitioner - "I find it very difficult to concentrate on the spoken word and would rather read." **

Hospital/University - "They are too poor in this field." [His field is rheumatology and he has never used MEDLARS.]

General Practitioner - [located at Kingsford, i.e. on the boundaries of U.N.S.W.] "Easy availability of these not present."

One respondent simply says of all of them that he never uses them because "Not available". And, finally, from a respondent who never uses any of the services since he considers them all inconvenient to

1. He lists these as the Medical Journal of Australia, The Practitioner, Current Therapeutics.

2. Information about MEDLARS etc., was sent to him. He wrote back expressing his appreciation and raising the very pertinent question of how he could then get access to the journals which would in this way have been brought to his attention.

* [i.e. MEDLARS and other computerized information services.]

** Presumably he believes all the services listed in A - E are sound tapes, and has therefore no acquaintance with MEDLARS or the other print services listed.

use and who feels that:

> "It is much better to attend a course as I do for at least a week a year, or to take a 3 month job at a hospital every 5 years or so as I have been doing."

One surprising trend that emerges from results of this survey is that the time-factor involved in information seeking is not considered as important as might have been expected: this despite the fact that some questions, for example, Question 23, almost invited respondents to consider response time a limiting aspect. Users seem prepared to expect and accept delays in acquiring information and plan their searching accordingly. This point is apparent in the responses to Question 17 and to Questions 20 to 24. Also apparent from these responses is the fact that services which were not used could have been useful to our respondents in their latest deliberate search for information. In other words, the fact that a service is not used can by no means be taken to suggest that it is useless.

(iii) Information seeking: problems and comments

The questionnaire's inquiry into the information seeking behaviour of the Non-M sample was based on their latest deliberate search for information whereas the M sample were asked about their latest use of MEDLARS. Thus Questions 19-24 were different for the two groups and it is more practicable to discuss the results separately.

Non-MEDLARS Users. The Non-M sample were asked (Question 19) whether they could recall the time lapse since their latest search for information. The 37 responses were in the following pattern:

1	within the past day
11	within the past week
8	within the past month
12	within the past six months
3	within the past year
2	could not recall

The information sought in this latest search was almost always related to direct patient care. The full categorization of replies is given in Appendix VI A: Question 20. Only 2 of the 37 Non-M respondents reported that they had used the services of someone else to find the information. (Question 21)

The structured and unstructured versions of Question 22, which asked respondents to reveal their behaviour in their latest deliberate search for information have already been mentioned on page 16 above. There were 17 respondents to Version "A", the unstructured or open version: 2 of them had in fact used MEDLARS even though their names were not on the list of N.S.W. MEDLARS users willing to cooperate, which was supplied by the MEDLARS Service. One of them reported that he "wrote to MEDLARS and received excellent information". Of the remaining 15, 6 consulted a library, 6 consulted their own collection, 1 a supplier of medical books and 2 used the services of an assistant.

Among respondents to the unstructured version of the Question, a textbook was the most frequently used source of information whether in their own collection or in a library. Only 3 respondents reported that they began their search by using an abstracting or indexing service. One of these was located at a medical centre and had within the previous week been seeking information on "use of drug in Rheumatoid Arthritis". Another was located in a research institute and was one of only two of the entire group of Non-M respondents who had received any training in searching for scientific information. His search was related to the pathology of a rare type of tumour. The third, located in a teaching hospital, was seeking information for an editorial.

Both the respondents who reported that they could not recall their latest deliberate search for information had been faced with Version "B" the structured version of Question 22. One respondent reported a search on a non-medical subject. Of the other 15 who answered this version, 7 reported that they had consulted their own collection, 4 a library, 2 a drug company and 2 a colleague. None of them had received any training in searching for information and one of them was moved to write (in answer to Question 18) that "this is the grossest defect in medical education". He was also the respondent who claimed that all the information services mentioned in Questions 15 and 16 were merely "rehashes" of Index Medicus and it can only be assumed that he is unaware, for example, of the significance of the more varied and flexible search strategies which MEDLARS makes possible. This respondent was the only one to have reported using an indexing service as the starting point of his latest deliberate search for information.

The information elicited by the open version of Question 22 suggests that time-consuming methods of searching are accepted. Again a larger sample would give a much more reliable picture of attitudes as well as methods in information-seeking. The following samplings of replies to Questions 15, 16 and 19 to 24 are included for the interesting, albeit partial insights they provide.

A respondent who reported never using the information services listed in Question 15 and ascribed this to lack of publicity about the services, had sought in the week previous to answering the questionnaire a "technique of particular method of operative surgery". His method was to check his own collection, telephone the "appropriate Book Company in Sydney" and then "Air Freighted the book from the U.S.A. which contained the information". He could not recall any information which he had tried and failed to obtain but he suggested that searching would be facilitated by the provision of an "Adequate area Library for surgical topics on Sth Coast N.S.W.".

Another respondent reported only using a Post-Graduate Committee's tape and cassette loan services "sometimes" and he also attributed lack of use of services to lack of publicity about them. In the previous week he had been seeking information for direct patient care. In this search he had consulted his own library "maintained at home" which has "subjects filed alphabetically and contains useful articles removed from journals". He reported no trouble in finding information but he "would appreciate advice on improving my own library related perhaps to a more expansive source of information at a distance". To this he added "I have no knowledge of computerised services".

Another respondent was seeking "Information on latest therapy technique related to a particular system". He described his search as "Library→librarian→reference books→journals". After that he used the "overseas sources of a pharmaceutical company". He reported finding it hard to obtain "up-to-date information on muscle pathology and biochemistry" and he would like to have "more modern textbooks".

Another, who never uses the information services listed, partly because he finds it hard to concentrate on the spoken word and would sooner read and partly because he feels the services are inconvenient to use, was seeking information on "a particular technique, application of Barton's forceps". He "wrote to a medical supply firm and asked for the book in question which I added to my library". He also reported that he had no trouble finding information and that he would appreciate "A library with even part-time librarian at our district hospital".

These cameos have been chosen at random from the replies received. Their indications of lack of information services available to the medical practitioner and of lack of knowledge of those that are theoretically available are very serious. Neither librarians nor administrators in universities, hospitals, medical societies and throughout the practitioners' environment appear to be fulfilling their responsibilities. There is obviously a role here for the National Library in promoting its own services, in informing all sectors of the medical community and in co-ordinating all efforts of information providers.

Several of our respondents are neither unaware of nor unconcerned at the present situation. One of them made the eminently reasonable request for:

"Information stating:

What facilities are available.
The programmes i.e. 1) Radiobroadcast
2) Landline

How to obtain information e.g. MEDLARS
[and] the other computerized services".

Another respondent, who had been unable to find a location for a journal title he wanted, suggested the provision of "A central bureau containing a list [of] Journals held by Medical Libraries throughout N.S.W. or Australia". This doctor works in a country hospital where there is presumably no librarian and where no-one knows of the existence of Scientific Serials in Australian Libraries. (There are in fact three locations in it for the journal he mentioned and these were sent to him). It is obvious that SSAL's existence is least publicized in areas where it is most needed, namely in relatively isolated places which would always be dependent on the information resources of more populous centres. For information specialists to adopt any attitude suggesting that the user is at fault in being ignorant of existing information sources is indeed to take up what has been well described as "a negative posture of intellectual snobbery". (27: 331)

The above respondent was one of only 3 who were able or willing to give an example of information needed and not obtained. (This was Version "A" of Question 23 which has already been mentioned on page 17 above). Another was the respondent mentioned earlier who complained of "Insufficient information on muscular pathology and biochemistry". The third, affiliated with a university and a teaching hospital, described his failure to get information as follows: "Index Medicus - to check precise reference for article by known author not listed under specific content heading, probably due to somewhat vague title". Apparently he is unaware that there is an author index to Index Medicus and did not think of the university or hospital library staff as likely sources of aid.

This respondent would like to see more rapid binding of Index Medicus and made the interesting suggestion of the "Possibility of more limited MEDLARS searches for special interest groups in Sydney or UNSW". He is not himself a user of MEDLARS because "Specific research interests in area of a common disease (peptic ulcer) → v. expensive search". It would be interesting to know, since no monetary charge is made by the Australian MEDLARS Service, on what criteria he rated such a search "v. expensive".

An analysis of the suggestions made about new and improved information services and facilities in answer to Question 24 is given below in Table 10.

Can you suggest any services, facilities, etc. which would have made searching easier or more convenient to you? Are there any general comments you would care to make on searching for and obtaining information?

Did not reply:	16
No:	7
Improved library facilities:	5
A telephone service:	3
More information about services:	2
Other comments:	4

Table 10. Suggestions of Non-MEDLARS respondents on improvements of information services and facilities.

Of the 7 respondents who felt that their information services were not in need of improvement only one was in general practice; 2 were in Government departments; 3 were in a university environment and 1 was in a research institute. Some of their comments suggest a rather low level of expectation, for example one wrote that:

"(1) If there is time librarians may help.

(2) If you have patience a search of articles and bibliographies will get you what you want.

(3) There is no speedy recovery."

Another reported: " ... excellent branch library at my institution .... except that I would like to be able to browse in new journals and do some of my own searching after 5 p.m. - I realize that this is impossible but it is the service and facility I would most prefer."

Two of the three suggestions for telephone services came from general practitioners. One suggested: "Possibly telephone communication with appropriate reference library (like poisons service RAHC) for urgent or semi-urgent material." Another spelt out his suggestions as:

"(1) A booklet list different fields of medical practice then group subheadings for these fields.

(2) A codification of these

(3) A central office which could then be phoned or written to for general/specific information.

The drug companies could pay for it instead of filling our letter boxes with garbage that we hardly ever open."

Finally, from the hard to categorize comments came those of a general practitioner (soon to retire):

> "Too much is offered by large complicated, colourful and sex-embroidered glazed and over-beautiful publications which are the antithesis of scientific thinking. In these years you have to dig to find facts of clinical medicine hence 'of all scientific discoveries, - computers and the moon -, none is as valuable as a waste-paper basket'. - quoted from Readers Digest. How right that is!"

[The last eight words and the quotation marks were written in red ink.]

Perhaps nothing quite so colourful appeared among the information-seeking problems and comments of MEDLARS users, but they are interesting nonetheless.

MEDLARS users. The M sample were also asked whether they could recall instances of failure to obtain needed information (Question 19), and an analysis of their replies is given in Table 11 below.

Can you give any recent examples of information, of whatever kind, which you tried and failed to obtain?

Did not reply:	33
No:	15
Failure to obtain known references:	20
Failure to obtain information on a subject:	7
Failure to obtain translations:	4

Note: The sum of responses is more than N (=77) because some respondents gave more than one example.

Table 11. Analysis of failures by MEDLARS users to obtain needed information.

In Question 20 in their versions of the questionnaire the M sample were asked to suggest improvements which could be made in information services and the results are analyzed in Table 12 below.

Can you suggest any services, facilities, etc., which would have made searching easier and more convenient to you? Are there any general comments you would care to make on searching for and obtaining information?

Did not reply:	33
No:	8
Improved library holdings, inter-library loan and copying services:	12
Alterations in the MEDLARS Service:	9
A service like MEDLARS in other areas:	8
More selective services:	6
Other comments:	10

Note: The sum of responses is more than N (=77) because some respondents gave more than one suggestion.

Table 12. Suggestions of MEDLARS respondents on improvements of information services and facilities.

This pattern of responses differs from that of the Non-M respondents. M respondents are presumably more alert to the literature, seek it more frequently and thus experience more instances of failure to obtain it. Since most of the M sample were in university environments with library facilities surely better than those available to most medical practitioners, in the present situation it is perhaps as well that people outside such environments tend not to seek the literature so often as their success rate could only be worse.

Failures to obtain known items were not caused by their rarity or obscurity. Absences at binders and on loan and availability only through inter-library loan were the most frequently cited causes of failure. It is therefore not surprising that the improvements most frequently suggested were improvements in library holdings and in inter-library loans and copying services. M-SDI respondents were responsible for 10 of the 12 comments critical of availability of material. These users obviously require prompt access to recent material and if it is at the binders or available only through inter-library loan, their needs cannot be served. This problem of availability of current materials can only become more acute as use of MEDLARS and other SDI services becomes more widespread. Along with the development of such services from national centralized data bases there must be a corresponding strengthening of local library holdings, especially of the current issues of frequently requested journal titles. Rationalization of holdings can only be applied to the less frequently and less urgently sought materials. Identification and provision of core

collections will have to be given high priority if information services for the medical community are to be improved.

Suggestions for alterations to the MEDLARS service included two for fact-to-face discussion with search analysts and three for more selective, quicker searches. The latter could be interpreted as proposals for an Australian AIM/TWX, that is for on-line access to the 100 or so journal titles covered by Abridged Index Medicus. The general tone of M users' suggestions, was, like that of the Non-M group, realistic and undemanding. Only one of the M sample went so far as to suggest a "computer terminal in hospital library". Evidence that he had thought about the functions of a literature service was provided by the respondent who wrote:

"A computerized service appears to be the ideal. From a comprehensive list of references the computer should be able to supply:

(a) All references on a particular subject for researchers and those writing articles.

(b) Recent references (<2 yr old) + a small number of older key references mainly for examination candidates and those wanting a "brief" appraisal of a selected disease or topic.

(c) Recent references (<1 yr old) on treatment of a selected disease e.g., leukemia (+ 1 or 2 key references) for those actively engaged in treating patients with newer drugs."

Several respondents who could suggest no improvements in their existing information services and facilities felt that they had good library services and were obviously experienced in literature searching. For example, one of them wrote:

"I think this triad:

1 Good library service and Inter loan.

2 Current Contents + reprints.

3 Medlars

will cover all my requirements."

Another commented as follows:

"The assistance given by interlibrary loan has been invaluable. Library staff have handled this promptly and have seldom failed to turn up the material.

Several very helpful literature searches by library staff have also been made. This has a spin-off since staff members tend to remember one's interests and pass on related material as it comes to their notice."

This respondent could recall no instance of failing to obtain information and his final comment was: "Doing nicely, thanks. (SMUGLY)".

(iv) Literature scanning and verbal communication

The questionnaire sought to discover the routine literature scanning practices and the extent of verbal communication both formal and semi-formal used by all respondents. (See Questions 6-9 in Appendices VI A and VI B.)

Literature scanning. There was, as had been expected, a marked difference in literature scanning practices of the M and Non-M groups. This is demonstrated in Tables 13 and 14 below showing numbers of journals scanned and numbers of abstracts and indexes consulted by the two groups.

	Non-M (N=37)	M (N=77)
0 - 3	15	12
4 - 6	16	17
7 - 9	3	25
10 - 12	2	9
13 or more	1	14

Table 13. Number of journals scanned by M and Non-M respondents.

	Non-M (N=37)	M (N=77)
0	20	16
1	7	24
2	5	16
3	5	11
4 or more	0	10

Table 14. Number of abstracts and indexes consulted by M and Non-M respondents.

Not only do M respondents scan more literature but they also use more abstracting and indexing services than Non-M, despite also using MEDLARS.

It is interesting that respondents to this survey reported scanning fewer journals than did those to the Australian MEDLARS Service's SDI questionnaire survey, already mentioned on page 7 above. In that survey 32% of respondents reported scanning 10-19 titles and 24% reported scanning 4-9 titles. Only 27% of respondents to this survey reported scanning 10-19 titles while 53%

reported 4-9 titles. Unlike the MEDLARS Service's survey, this investigation required that respondents name the journal titles they had scanned in the last month. Only two refused to do so; one claiming to scan 30 titles and the other 60 titles. The investigators suggest that their results are more accurate than those derived from respondents merely naming a figure. Likewise, respondents to this survey were asked to name the abstracting and indexing journals they had looked at in the last month, and here again the investigators believe that the results are representative of reality.

Another advantage of requesting journal titles was that it became apparent that Non-M respondents regarded their perusal of abstracts in general journals, for example in Current Therapeutics as use of abstracting journals. This again suggests that figures derived from surveys wherein users have not had to specify names of abstracts and indexes consulted ought to be treated cautiously.

Journals scanned. Respondents named a total of 275 different journal titles which they scanned. A breakdown of this figure is given in Table 15 below.

	Non-M (N=37)	M-Retro (N=40)	M-SDI (N=37)
No. of titles named	79	162	126
No. of titles exclusive to each group	44	93	68

Table 15. Number of journal titles scanned in total and exclusively by Non-M, M-Retro and M-SDI respondents.

The pattern of overlap in these figures while difficult to show clearly in the above table is nonetheless interesting. 22 titles were reported by some members of all three groups. In addition, Non-M and M-Retro had 12 titles in common; M-Retro and M-SDI had 35; but there was only one other title in common in the report by respondents in the Non-M and M-SDI groups.

The title most frequently named overall was the Medical Journal of Australia, next was the British Medical Journal, followed by the Lancet and the New England Journal of Medicine. Titles named by at least five respondents in any one group are listed in Table 16 below ranked in order of total mentions.

Journal Title	Non-M (N=37)	M-Retro (N=40)	M-SDI (N=37)	Total (N=114)
Medical Journal of Australia	25	18	13	56
British Medical Journal	12	16	7	35
Lancet	6	15	7	28
New England Journal of Medicine	0	10	10	20
Modern Medicine	12	1	2	15
American Journal of Medicine	2	8	1	11
Nature	0	5	6	11
British Journal of Surgery	5	0	0	5
Annals of Internal Medicine	0	5	0	5

Table 16. Titles and number of reports in each group of journals most frequently scanned.

A feature of the results for all groups is that so many different titles have been named and that there is so little clustering. Among the Non-M sample 62 titles were reported by only one respondent, among M-Retro 121 were reported by only one respondent, and among M-SDI 96 were reported by only one respondent. The resulting curves are disconcerting until the degree of their conformity to Lotka's equation is recognized and the possibilities with a larger sample of using bibliometric analysis for predicting behaviour of the medical community. It would also be interesting to investigate the effect, if any, of a larger sample on the scatter pattern suggested by these results.

With the small numbers in this investigation the most useful insight is provided by differences in titles as well as in numbers of titles scanned by the three groups. The distinctiveness of the Non-M from the M sample emerges again with the indication that the M-SDI respondents are even less like the Non-M respondents than are the M-Retro.

Abstracts and indexes scanned. A similar pattern to that for journal scanning emerges in considering the total of 64 titles of abstracts and indexes reported by respondents as a whole. Breakdown of this figure by user groups is given in Table 17 below.

	Non-M (N=37)	M-Retro (N=40)	M-SDI (M=37)
No. of titles named	21	34	26
No. of titles exclusive to each group	14	24	18

Table 17. Number of abstracts and indexes scanned in total and exclusively by Non-M, M-Retro and M-SDI respondents.

Again the degree of overlap is interesting. Only 4 titles were reported by some members of all three groups. In addition, Non-M and M-Retro had one title in common, whereas M-Retro and M-SDI had 3 and there were no titles common only to Non-M and M-SDI.

The four titles common to all groups were Current Contents, Index Medicus, Modern Medicine and the Excerpta Medica series. For each group, however, the order of most consulted titles varied and these differences can most clearly be indicated by presenting the five most cited titles for each group in Tables 18, 19 and 20 below.

Title	No. of Respondents Who Listed
Modern Medicine	9
Current Therapeutics	4
Current Contents	2
MIMS (Monthly Index of Medical Specialities)	2
Index Medicus	2
16 other titles	1

Table 18. Non-M respondents: abstracts and indexes most frequently used from a total of 21 titles reported.

Title	No. of Respondents Who Listed
Current Contents	14
Index Medicus	9
Psychological Abstracts	4 *
Excerpta Medica series	3
Modern Medicine	3
8 other titles	2
21 other titles	1

Table 19. M-Retro respondents: abstracts and indexes most frequently used from a total of 34 titles reported.

Title	No. of Respondents Who Listed
Index Medicus	12
Current Contents	11
Excerpta Medica series	4
Psychological Abstracts *	4
Chemical Abstracts	3
2 other titles	2
19 other titles	1

Table 20. M-SDI respondents: abstracts and indexes most frequently used from a total of 26 titles reported.

At first sight the dependence of M-SDI respondents on *Index Medicus* may seem surprising. It is in fact in line with their tendency, revealed by some respondents and discussed later in this report, to use the MEDLARS service to cover the literature in areas of peripheral interest while using other methods to cover the literature in areas of central interest.

* Some of this usage would be accounted for by the 4 psychologists, 2 M-Retro and 2 M-SDI.

With the small numbers represented in our samples it would be pointless to attempt any detailed statistical analysis of these results. On the face of them however some obvious observations can be made. The fact that 46 of the total of 64 titles of abstracts and indexes were used by only one person leads to the suspicion that this may be a result of wasteful and inefficient over-supply of competing brands rather than an indication of the uniqueness of each person's information needs. This suspicion is reinforced by the knowledge that there is much overlap in coverage among the various abstracting and indexing services in the field. Another observation is the tendency, already mentioned on page 32, for Non-M respondents to regard as abstracting and indexing services publications which are not exclusively or even principally so, for example, Current Therapeutics.

In general terms, the indications on literature scanning yielded by this investigation are that non-users of MEDLARS scan fewer journals than MEDLARS users and that they are less likely again to scan abstracting and indexing journals than are MEDLARS users. There are, moreover, differences in the titles scanned, especially in the abstracts and indexes, and non-users of MEDLARS are likely to have even less in common in these matters with users of the MEDLARS SDI service than they have with users of the Retrospective Search service. The use of all the literature by all users is characterized by an extended scatter pattern which on a large sample could lend itself to interesting bibliometric analysis as well as to exploration of possibilities of rationalization among competing services.

Verbal communication. The investigators were anxious to gain indications about opportunities taken by respondents to engage in formal and informal verbal communication with their colleagues. As well as indications yielded by Question 5 (see page 20) on respondents' recourse to their colleagues in time of information need, data were gathered in Question 8 on formal conferences and in Question 9 on seminars, talks, case-presentations, etc. attended by respondents in the month previous to completion of the questionnaire.

As in the questions on literature scanned, an attempt was made in the wording of the questions to get respondents to give the titles or topics of these meetings. The attempt cannot be judged an unqualified success. One respondent, faced with Question 9 "Can you recall the number and the topics of any seminars, talks, case-presentations, etc. that you have been able to attend in the last month", wrote tersely and not unreasonably "Yes, of course!"

An analysis of the results of Questions 8 and 9 is given in Tables 21 and 22 below.

No. of formal conferences attended	Non-M (N=37)	M (N=77)
0	21	52
1	8	19
2	2	5
3 or more	6	1

Table 21. Number of formal conferences attended in past month by Non-M and M respondents.

No. of seminars, talks, case-presentations, etc. attended	Non-M (N=37)	M (N=77)
0	20	18
1 - 3	9	20
4 - 6	4	24
7 - 9	2	8
10 - 12	1	5
13 or more	1	2

Table 22. Number of seminars, talks, etc. attended in past month by Non-M and M respondents.

No clear trend emerges from these figures. M respondents appear to attend formal conferences slightly less than Non-M respondents and to participate in slightly more semi-formal meetings, which could be expected in view of the fact that most M respondents work in a combined hospital/university environment. Table 23 gives the average attendance per person per month for the two groups.

	Non-M (N=37)	M (N=77)
Conferences, etc.	1.2	0.44
Seminars, etc.	1.6	3.2

Table 23. Average attendance at formal conferences and at seminars, etc. of Non-M and M respondents in past month.

(v) Professional activity and publications

All respondents were asked to answer questions relating to their publications, to the talks and so on which they gave and to their membership of professional organizations. (Questions 10 to 14).

Professional activities: The results indicate that non-users of MEDLARS may tend to belong to more professional associations although the differences for Non-M and M samples shown in Table 24 below are not very marked.

No. of Associations	No. of respondents Non-M (N=37)	M (N=77)
0	4	5
1 - 3	21	48
4 - 6	7	20
7 - 9	4	4
10 or more	1	0

Table 24. Membership of professional associations

The average for Non-M respondents was 3.2 associations and for M respondents 2.8.

In other areas of professional activity, however, M respondents are more likely to participate. They give more editorial advice and deliver far more papers and talks both within their own organizations and outside them. As indicated in Table 25 below, most Non-M respondents had neither given editorial advice nor addressed professional meetings in the two years prior to their completion of the questionnaire.

Activity	Non-M (N=37) Yes	No	M (N=77) Yes	No	Did not reply
Acted at editor, etc.	10	27	34	41	2
Delivered papers.	12	25	54	22	1
Given talks at another organizations.	20	17	58	18	1
Given talks at own organizations	2[illegible]	16	66	10	1

Table 25. Professional activities of Non-M and M respondents over a period of two years.

A further breakdown of the M sample responses as given for Question 11 in Appendix VI B again suggest that M-SDI differ more from Non-M than do M-Retro. M-SDI are much more likely to have given editorial advice than are M-Retro.

Publications. Asked whether they had published in the past two years, respondents answered as in Table 26 below.

	Yes	No	Did not reply	Total
Non-M	11	26	0	37
M	61	14	2	77

Table 26. Numbers of Non-M and M respondents who had published over a period of two years.

These results again suggest substantial differences between the two samples, the nature of which is further revealed in the breakdown of numbers of items published by each group as shown in Table 27 below.

No. of papers or titles published	No. of Respondents			
	Non-M (N=11)	M-Retro (N=32)	M-SDI (N=27)	Total (N=70)
1 - 3	8	24	13	45
4 - 6	3	4	10	17
7 - 9	0	3	4	7
10 or more	0	1	0	1

Table 27. Numbers of papers published by Non-M, M-Retro and M-SDI respondents over a period of two years.

Respondents were asked to list the titles of the journals in which they had published and only 2 people declined this task which explains why there were only 59 M respondents represented in Table 27 above. Many respondents also gave titles and complete bibliographical citations for their papers and so provided interesting supplementary information.

Three distinct profiles seem to be emerging of the Non-M, M-Retro and M-SDI authors. M-SDI respondents tended to publish more papers per person: 14 of them had published 4 or more papers compared with 7 M-Retro and 3 Non-M respondents who had done so.

It is also interesting in Table 28 below to look at average numbers of papers published by each group of authors and to compare them with averages for the numbers of professional associations to which they belong. The total sample averages for memberships were 3.2 for Non-M and 2.8 for M.

	Non-M (N=11)	M-Retro (N=32)	M-SDI (N-27)
Average number of papers per author	2.5	3.0	3.8
Average number of professional memberships per author	5.0	3.5	2.8

Table 28. Average numbers of publications and of professional memberships of authors in Non-M, M-Retro and M-SDI samples.

The degree of scattering of papers among journals is suggested by the fact that:

27 M-SDI	authors published	103	papers in	72	journals
32 M-Retro	" "	96	" "	54	"
11 Non-M	" "	28	" "	18	"
and all 70	" "	227	" "	132	"

Titles of journals in which three or more respondents had published are given in Table 29 below with numbers who contributed to each of them.

Title	No. of respondents publishing			
	Non-M (N=11)	M-Retro (N=32)	M-SDI (N=27)	Total (N=70)
Medical Journal of Australia	6	8	11	25
Australian and New Zealand Journal of Medicine	0	4	1	5
Pathology	1	2	1	4
Anaesthesia and Intensive Care	1	2	0	3
Australian Journal of Experimental Biology and Medical Science	0	2	1	3
British Medical Journal	0	2	1	3
Nature	0	2	1	3

Table 29. Titles of journals in which 3 or more respondents had published over a period of two years.

18 other titles had carried publications by two respondents and the remaining 107 titles had each carried publications by only one respondent. Of the 18 journals which had carried articles by two respondents, none carried articles by two Non-M respondents, only one carried articles by two M-Retro respondents, but 5 carried articles by two M-SDI respondents.

When the data assembled in this investigation on literature scanning, verbal communication, professional activities and authorship are considered as a whole, it may be tentatively proposed that non-users of MEDLARS acquire more information through verbal channels of communication than MEDLARS users who at the same time tend to deliver more information verbally and much more information in written form than the non-users. These indications agree with findings (reported on page 20) that Non-M respondents most frequently used conversation with colleagues in satisfying specific information needs whereas the source most frequently reported by M respondents was a library.

On the results of Question 5, analyzed in Appendix VI A, it would seem unwise to assume that the type of information sought is the sole influence on Non-M respondents' choice of a channel of communication. For example, as many of them reported that they talked to a colleague a lot as that they used a library a lot in seeking information related to research. In other words, it is not sufficient to argue that it is the <u>nature</u> of the professional activity <u>alone</u> that influences choices of verbal or written information channels. The activity is no doubt an important factor, but it is only one among several variables, such as consumer preference, which must also be considered.

These factors have obvious relevance for the provision of effective information services.

vi Summary of findings related to both Non-M and M Samples

The following points summarize briefly the findings of the parts of the questionnaire which were common to Non-M and M samples.

Information needs and information sources

i Most Non-M respondents considered available information services to be adequate. Most M respondents considered such services as above average or better.

ii Non-M respondents generally spent most of their time in direct patient care and required information mostly for general awareness and next for direct patient care. M respondents generally spent most of their time on research and/or teaching and required information mostly for research and next for general awareness.

iii For Non-M respondents talking to colleagues was the most frequently used source of information, followed by their own personal collection and then a library. For M respondents a library was the most frequently used source, followed by their own personal collection and then talking to colleagues.

Factors influencing use of services

i The various information services available in medicine which were listed were almost never used.

ii The main reason for non-use was lack of publicity about what the services offer and how they can be contacted. The feeling that the services would not be of any use was also a factor, followed by the fact that the services were considered inconvenient to use.

iii More Non-M respondents considered the services inconvenient to use than did M respondents.

iv Comments from both groups of respondents indicate a very serious lack of awareness about available information services.

Information seeking: problems and comments

i Most Non-M respondents had sought information for direct patient care at least within the past month.

ii The most frequently used source was a textbook in either their personal collection or a library.

iii Non-M respondents complained of inadequate library facilities in general terms, whereas M respondents most frequently complained about failure to acquire known references.

Literature scanning and verbal communication

i Non-M respondents scanned fewer journals and fewer abstracts and indexes than M respondents and the two groups tended to concentrate on different titles.

ii Non-M respondents attended more formal conferences, while M respondents attended more seminars, talks, and other less formal meetings.

Professional activity and publications

i Non-M respondents were less active in the fields of publishing, editing, presenting papers and giving talks.

ii When Non-M respondents disseminated information they did so more through the spoken than the written word. On an average they also tended to belong to more professional associations than did M respondents.

C. Survey findings - MEDLARS Users

The section of the questionnaire sent only to MEDLARS users was designed to elicit information in two areas. The first area was concerned with general aspects of using MEDLARS; the second area was concerned with more detailed information about the results of the latest search received.

(i) MEDLARS: General Aspects

Length of use. Most of our M sample had been using the service for between one and two years, and as was expected, M-SDI respondents tended to have used the service the longest and M-Retro respondents predominated among those who had been using the service for six months or less.

	M-SDI (N=37)	M-Retro (N=40)
6 months or less	6	9
6 months to one year	6	6
1 - 2 years	14	17
More than two years	10	7
Did not reply	1	1

Table 30. Length of time for which M-SDI and M-Retro respondents had used MEDLARS.

More M-SDI respondents used both services than did M-Retro respondents and this again is understandable since an SDI search is a logical follow-up of a successful Retrospective Search. The comments of one respondent, based in a teaching hospital affiliated with the University of New South Wales, were at once disconcerting and a reinforcement of previous insights on lack of knowledge of services. He had been using the Retrospective Search Service for between one and two years, and he wrote next to the item mentioning the SDI service: "Did not know this is available, but will use it." Incidentally, this respondent reported that he generally discussed his search requests with a librarian and he rated the information services available to him as "excellent".

The composition of the M sample with regard to use of SDI and Retrospective Search services is shown in Table 31 below.

Service used	M-SDI (N=37)	M-Retro (N=40)
Retrospective Search only	2*	27
SDI only	9	1*
Both	24	8
Neither	1	4
Did not reply	1	0

Table 31. Use of MEDLARS SDI and Retrospective Search services by M sample respondents.

* These inconsistencies occurred because in some cases where the person to whom the questionnaire was addressed was absent or unable to complete it, it was passed on to another person in the organization.

The reasons given by the 5 respondents who have now ceased to use either service may be of interest. The one former SDI user wrote:

> "I did receive one current awareness search, though I don't remember asking for it. I stopped it as I had completed the project, and also as I am about to go to the U.S.A. for a year."

One of the former Retrospective Search users also indicated that he had ceased to use the service as he had completed his project, and another because he felt that "animal aspects" were not well covered. The third, who indicated that he had used both services, gave a curious reason. He wrote: "Unfortunately none of the current literature has been forwarded since the initial request in December '73".

One can assume either that there is a delay of six months in receipt of output from his SDI profile or that he is under the impression that a Retrospective Search request is automatically converted into an SDI request. That the latter alternative might be the case is not as improbable as it perhaps sounds, in view of the reason given by the fourth former MEDLARS user who reported:

> "I was under the impression that further information regarding continued use of MEDLARS would be forwarded to me following completion of the Appraisal Form which I completed after receiving the initial print-out."

Data from the eleven personal interviews conducted in this investigation reveal that this is not an isolated case. Users who have completed the Appraisal Form and given an estimate of the percentage of relevant items retrieved, examples of relevant items not retrieved and so on, appear to expect that their efforts will generate some action on the part of the MEDLARS Service. This may well be impossible granted the staff now available at the MEDLARS Service, but it is not an unreasonable assumption from the users' point of view. Completion of the Appraisal Form demands considerable time and effort and if, for example, the results of the appraisal suggest that the search formulation was too broad is it unrealistic for the user then to expect a narrower search to be run? To be asked to fill in a time-consuming form each time one receives a print-out and then to see no visible results for one's efforts is just not satisfactory to the user. The MEDLARS Service may be making very good use of the data so obtained, however, the users have no way of knowing whether this is so.

At the outset of this study, the investigators submitted a MEDLARS Retrospective Search request on information services in bio-medicine. This has since been converted to an SDI profile. The idea was to assist in the literature survey for the study and to gain experience as MEDLARS users. The experience gained has been very much in line with that reported by respondents.

Library interaction in the MEDLARS Service. Just over half the respondents had first heard about the service through a library and roughly one third from a colleague. Other sources included a newspaper report, an item in the Medical Journal of Australia, a personal visit to the National Library of Australia and a "can't recall".

	M-SDI (N-37)	M-Retro (N-40)
Library	19	22
Colleague	12	14
Other	2	3
Did not reply	4	1

Table 32. Sources from which M respondents learnt of the existence of MEDLARS.

Most respondents did not discuss their search requests with a librarian or information officer: only 14 out of 37 M-SDI and 18 out of 40 M-Retro respondents did so. In this regard further analysis of the behaviour of the 67 respondents who had heard about MEDLARS from a library or a colleague is interesting and is presented in Table 33 below.

Source of initial MEDLARS knowledge	Discuss search requests with librarian	
	Yes	No
Library	22	19
Colleague	8	18

Table 33. Interaction with library in preparing MEDLARS search requests by M respondents who heard about service from library or colleague.

Those who have heard about the service through a library are obviously more likely to discuss their search request with a librarian. This is not because the others do not have access to a library: the 18 respondents in the "Colleague - No Consultation" category included 9 people located at the University of Sydney and 4 people located at the University of New South Wales. Of those who did consult a librarian 15 were located at the University of Sydney, 3 at Repatriatión General Hospital, Concord, 2 at St. Vincent's Hospital, 2 at Sydney Hospital, 3 at other hospitals and one in a Government Commission. It is obvious therefore that the physical presence of a library is not the determining factor.

The most common reason given for not consulting a librarian was the feeling that a librarian or information officer would not possess the necessary subject knowledge. Again the physical presence of a large medical library was not the determining factor. 10 of the respondents who felt that a librarian would not have the necessary subject knowledge were located at the University of Sydney and 4 at the University of New South Wales. Respondents' reactions to the reasons suggested by the questionnaire for their not consulting a librarian are analyzed in Table 34 below.

	M-SDI	M-Retro
Discussion unnecessary	8	5
No librarian conveniently available	3	6
Librarian does not possess necessary subject knowledge	12	12
Prefer to deal directly with search analyst	3	4

Table 34. Reasons for lack of interaction with library in MEDLARS search request by M respondents.

The results show that few respondents felt consultation was unnecessary: that more M-SDI respondents felt this way could perhaps be attributable to the fact they tend to have used the service longer and thus may feel less in need of assistance.

Relevance and recall. An attempt was made in the questionnaire to probe respondents' estimates of and attitudes to the performance of the MEDLARS system as regards the proportion of items in search outputs relevant to their requests. Text and results for Question 26 are given in Table 35 below.

Statistics on the Medlars Service show that generally searches will produce some citations that are not relevant to your request and will miss some citations which are relevant. In your personal experience has this: (Please tick as appropriate)

	M-SDI (N=37)	M-Retro (N=40)
Seriously impaired the usefulness of the search	4	4
Caused some inconvenience but you accept it as an inevitable part of the system	11	21
Not inconvenienced you unduly	19	15
Did not reply	3	0

Table 35. Reactions of M respondents to relevance/recall performance of the MEDLARS system.

Respondents were also asked (see Appendix VI B Question 38) whether they would prefer to scan fewer references at the risk of missing some relevant citations. Their overwhelming reaction was "NO" : only 5 of the 77 respondents were willing to take the risk. Most respondents reported that they had found the proportion of relevent to non-relevant items in their search outputs acceptable (see Appendix VIB : Questions 37); and had derived at least "some help" from the previously unknown citations in their latest search outputs (see Appendix VI B : Question 40). It would seem therefore that dissatisfaction with relevance is based on the presence of non-relevant items in output rather than awareness of the absence of relevant items.

When one recalls that M respondents, as a category distinct from Non-M respondents, are mostly engaged in research and teaching, it is not surprising that they do not want to risk missing any relevant material. When one also recalls that M respondents are library orientated, accustomed to scanning quantities of journals, abstracts and indexes, it is not surprising that about half of them reported that they were not inconvenienced unduly by having to scan a large print-out to choose those citations that appear relevant.

A different view can be taken of these figures. Granted the characteristics of the M group outlined above, is it disturbing that nearly half of them were inconvenienced by having to scan a number of non-relevant citations in MEDLARS search results? Perhaps the most disquieting feature of the results is that nearly half of the respondents indicated that they had been caused "some inconvenience" by MEDLARS relevance/recall performance and they accepted without argument the assumption suggested on the questionnaire, namely that it was "an inevitable part of the system." That the basis of such an assumption is likely to be inadequate is suggested by the facts that about one third of respondents had heard about the MEDLARS service from a colleague, and that more than half of them had not consulted a librarian in formulating search requests though very few of them felt consultation in preparing requests was unnecessary. It would certainly seem safe to hypothesize that non-users of MEDLARS who, on the indications of this investigation, are less research and library orientated would be more inconvenienced.

The courses of action pursued by M respondents after experiencing inconvenience from the relevance/recall performance of MEDLARS do not inspire confidence in the possibility of realistic appreciation of the system's capabilities being gained through use of it. The results of Question 27 are analysed in Table 36 below.

	M-SDI	M-Retro
Discussion with librarian	1	5
Discussion with MEDLARS Service	6	3
Self amend request statement	6	9
No action taken	8	9
Ceased to use MEDLARS	0	1

Table 36. Subsequent action of M respondents who were inconvenienced by relevance ratios in search outputs.

When interpreting the above figures one point to consider is that some respondents had already indicated that they considered their comments on the Appraisal Form to be discussion with the MEDLARS Service. The self-enhancing bias inevitable in questionnaire surveys has also to be kept in mind. Not all are as frank as the respondent who indicated that he had amended his search request himself but then added "intend to anyway".

Of the 8 users who found that the relevance ratio "Seriously impaired the usefulness of the search" 3 did not take any action, 2 amended their search request themselves, 2 discussed the matter with a librarian, 1 switched to BA Previews after discussion of the matter with the MEDLARS Service.

The one respondent who had ceased to use MEDLARS was a psychologist and he commented that "Medlars was most satisfactory in willingness of operators, via written communication, to co-operate further, but (as previously stated) I felt my particular area was not adequately covered." He had heard about MEDLARS from a colleague and had not discussed his request with a librarian. He suggested that one reason his search was unsatisfactory was "probably because of difficulty in expressing my research area for retrieval purposes."

Lancaster in a report on his original evaluation of MEDLARS wrote:

> "...it appears that the best request statements (i.e., those that most closely reflect the actual area of information need) are those written down by the requester in his own natural-language narrative terms. When he discusses it orally, with librarian or search analyst, a transformation takes place and, unfortunately, the request statement captured by the librarian or searcher is frequently a less perfect mirror of the information need than the one prepared by the requester himself in his own natural-language terms". (36 : 118-9)

Of the 299 searches evaluated by Lancaster 46 entered the category of "natural-language narrative" and all but 6 of them originated from academic or research environments. The investigators suggest that the 46 users who in 1966 and 1967 on their own initiative wrote to the National Library of Medicine for a MEDLARS search were probably atypical of medical information users then and now. They may well have been more alert to new information services in general, and to the subject coverage and refinements in search strategy available in MEDLARS.

One point that has emerged noticeably in the eleven interviews conducted in this study is the way in which users alter their search requests to fit in with what they imagine to be the restraints of the system. For example, one person who wanted literature on the effect of L-Dopa on the propriospinal bundles in the cat subsequent to severance of the spinal cord, requested a search on stimulation of the spinal cord because he thought that his real request would be too refined for the system to handle.

Another was interested in the levels of blood lipids in cases of coronary malfunction and the output produced a lot of citations referring to blood lipids and diabetes. He was completely unaware of the Boolean strategies used in searching and consequently completely unaware of the possibility of a "not" formulation. One person interviewed had requested a search on analgesic abuse studies when in fact only the psycho-social correlates of analgesic abuse were wanted. Another seeking information only on operative treatment of transexualism had received according to him "hundreds" of citations on the psycho-social aspects.

Of the 11 people interviewed only 2 had any knowledge about the search strategies available: one had gained his knowledge whilst visiting the National Library of Australia, the other from experience overseas.* The other 9 individuals had heard about the service through colleagues, had written direct to the MEDLARS Service, had no idea of the refinements possible in search strategies, and did not even know the significance of the asterisked index terms which indicate the major subjects of the document. Again, the most disquieting feature of the interviewing was that 10 of the 11 interviewees expressed themselves quite satisfied with the MEDLARS service and had accepted the high number of non relevant citations as an inevitable part of the system. As one person interviewed explained, he had had a Retrospective Search a year or so ago and in his Appraisal Form had mentioned the high number of non-relevant citations and listed a couple of known relevant citations missed. When he failed to receive any feed-back explaining the reason for this having happened he assumed that it must be a somewhat discourteous way of conveying to him the information that such a result was inevitable. Consequently, with his second search he was expecting a similar result and expressed himself content with it.

Again, it would be easy to adopt a position of superiority and blame the user for not knowing the system and perhaps for being naive. And maybe it is partly the users' "fault" since printed information about searching possibilities and subject coverage are sent with each print-out. However, as is well known, people tend not to read mailed, printed information leaflets and the MEDLARS leaflets even if read would probably not convey much to the person unfamiliar with machine-readable data base terminology.

The data can perhaps be summed up by remarking that there appear to be a number of "satisfied" users not using MEDLARS to best effect, as well as a number of users who express some dissatisfaction with the service but who are unaware that this might be ameliorated. In both cases lack of knowledge about what the system can do seems largely to blame. One way of overcoming the problems may be to have persons knowledgeable about the system located in the users' working environment proffering verbal information.

* He alleged that he had informed his librarian about existence of the MEDLARS service; his library is a large branch library in a metropolitan University.

The number of cases of library failure indicated by questionnaire answers and comments in interviews with users and visits to libraries is disturbing. A librarian helped a user formulate Retrospective Search requests but failed to mention the existence of the SDI service. Another librarian had to be informed by a user of the existence of an Australian MEDLARS Service. A hospital library had no BA Previews forms available because "no-one has asked us for them yet". A respondent with access to the medical library of a large university wrote that "Surprisingly the library is 'quiet' on the availability of this service".

Apart from the problem of whether non-users of existing services could use them or whether alternative services should be developed for them, it is apparent that there are immediate steps that could be taken to ensure that present users utilize available services more effectively. This is not only for the sake of user-satisfaction, but also from a purely economic point of view, for example of the time and cost incurred by the MEDLARS Service in handling requests. One user wrote: "Canberra usually rings me up and asks me to narrow the field down! I find the Canberra people more useful than my Librarian". No doubt he does but it hardly appears a very economical or a particularly effective way of conveying information about the system.

The concept of relevance.

As already mentioned on page 17, the investigators were anxious to gain some insight into the criteria on which M respondents' concepts of "relevance" were based. MEDLARS users are, after all, frequently asked to record relevance judgements from which important assessments of the quality of the system are made. Again as already recorded not all M respondents appreciated the relevance of our inquiries on the matter. Question 28 reproduced Saracevic's diagram of the concept. Two of the respondents even felt it necessary to add to the possibilities of definition presented in the terms suggested: one added "quality" to the first circle and another added "me" to the last circle. In Table 37 the diagram has been marked to indicate that there is a consensus that:

> "Relevance is a measure, judgement or estimate of the appropriateness, applicability or usefulness existing between the information provided and an information need as judged by a user or requester".

This confirms the opinion expressed by Saracevic in a personal letter to the investigators that despite the variety of possible interpretations of "relevance", there is in fact a consensus of opinion. This result allayed the investigators' fears that MEDLARS users might in fact have been inclined to interpret "relevance" as a measure of the fit existing between a document representation and a question representation. That their interpretation is based rather on the relevance of the information provided to their information need makes fairly safe the acceptance of their expressed tolerance for relevance ratios.

Could you indicate, by ticking the appropriate terms on the following diagram, what "relevance" means to you.

Relevance is a:

.1. measure
... degree
... extent
... quantity
... dimension
.2. judgement
.3. estimate
... appraisal
... relation

Of the:

... utility
... importance
... matching
... informativeness
.1. appropriateness
... satisfaction
... connection
... fit
... similarity
.2. applicability
... closeness
.3. usefulness
... bearing

Existing between a:

... document
... document representation
... references
... textual form
... fact
.1. information provided

And a:

... question
... question representation
... research stage
.1. information need
... point of view
... use of orientation
... treatment

As judged by a:

.2. requester
... intermediary
... expert
... librarian
... information specialist
... delegate
.1. user
... person
... judge

Table 37. The Concept of Relevance.
From: SARACEVIC, T. "The Concept of Relevance" in his Introduction to Information Science. New York, Bowker, 1970 p.121

Only one of the four respondents who did not answer Question 28 left it blank. The comments of the others may be of interest. One psychologist wrote: "I consider all the above apply - perhaps in different cases". Another, also a psychologist, wrote: "Most of these in some cases - this is ridiculous. From 10 yrs in market research, I would never ask such a question. Impossible". And a medical practitioner wrote: "I am a scientist not a philosopher, I am sorry, but to me this page is IRRELEVANT!"

The investigators cannot agree with the last comment, but would be prepared to accept in any future study of a population of MEDLARS users that there is among them a workable degree of consensus in their concept of relevance.

(ii) <u>MEDLARS: Critical incident</u>

The critical incidents chosen for investigation among the MEDLARS sample were the latest retrospective search received by M-Retro and the latest current awareness search received by M-SDI. Questions 30-42 in both versions of the MEDLARS questionnaire sought the same information from both groups even though the wording had to be varied slightly.

<u>Why MEDLARS had been used</u>. Respondents were asked to give their reasons for having used MEDLARS. 13 M-SDI and 2 M-Retro respondents could not or would not do so. Answers of other respondents have been categorized and are given in Table 37 below.

	SDI (N=37)	Retro (N=40)
Starting new research	0	23
On-going research	4	3
Keep up-to-date	7	0
Wider scanning	8	0
Save time	3	0
Writing a paper	0	4
Clinical application	0	5
Other	2	3
Did not reply	13	2

<u>Table 37. Reasons of M-Retro and M-SDI respondents for using the MEDLARS Service.</u>

Achieving a wider search of the literature and keeping up-to-date were the most common reasons for use advanced by M-SDI respondents. There seems to be a tendency for the SDI service to be used in two slightly different ways. That some used it <u>instead</u> of personally scanning the current literature became apparent in the comments of those who said they used it for keeping up to date.

For example:

> "As an attempt to save time in keeping up with current developments. Journal or abstract scanning is time consuming and is likely to miss the more obscure articles."
>
> "Keeps you up to date saving time".
>
> "Save hunting through new reviews etc."

The comments of other M-SDI respondents indicated however that they used the Current Awareness Service as a supplement to personal scanning in order to achieve a wider coverage of journals. For example:

> "Reports articles in journals not readily available".
>
> "In an attempt to keep up with all the relevant, current literature as the libraries with which I have contact do not subscribe to all the relevant journals".

These two different types of usage have implications for any implementation of MEDLINE in Australia. The first category would probably be satisfied with access to a data base of the (say 100) most cited journal titles. The second category probably would not.

The major use of the Retrospective Search service by M-Retro respondents was when embarking on a new research topic where an extensive search of the literature was desired. Details of the 5 respondents who used it to find information for clinical application may be of interest, particularly for the indications about the timeliness of the Retrospective Search service.

<u>Timeliness of Retrospective Search service</u>. The first respondent was located at a psychiatric centre and was "starting a new treatment programme". He was satisfied with the timeliness and relevance ratio of his print-out, but experienced delays in acquiring hard copy. He found that his search had helped him considerably because it "Helped with setting up of different treatment approaches - both theoretical and practical value".

The other respondents were also satisfied with the timeliness of the MEDLARS Service. One located at a hospital was seeking a "Review of latest publication on the treatment of lymphosarcoma with chemotherapy just to check what I am not aware of in my day to day practice". He found his print-out to be of some help as it brought to his attention some references he had missed.

Another, located at Royal Alexandra Hospital for Children wrote: "References were required to reports of an exceptional occurrence - development of neoplasia in cases of congenital adrenal hyperplasia". He also found that his print-out came in time and was of some help as "it became evident there must be few relevant

cases reported". However, he found that the time taken to obtain the documents cited reduced the usefulness of the search "very much".

The next respondent was located at the same hospital and he was "commencing specific clinical work dealing with psychological problems of diabetic children". He found his print-out to be "useless": partly because "none of the medically orientated articles covered my topic to the depth required" and partly because he did not seek "a lot" of the few relevant items because inter-library loan would have taken too long.

The last respondent, in a hospital pathology department, was seeking "References on a disease which I frequently diagnosed on pathological examination and was almost invariably missed clinically". He also found that his print-out arrived in time to be of use and in fact proved to be of considerable help by enabling "comparison with experience and thinking of specialists in other geographical areas". He found that most of the citations were not easily accessible and that he had to wait a considerable time to acquire foreign-language material though this did not trouble him unduly.

All the M-Retro sample were asked whether their print-out had been received in time to be used as originally intended: only one respondent replied "no" and 2 did not answer. It is interesting that even those who were seeking information for clinical application found the service satisfactory in timeliness. It appears that it is in the acquisition of hard copy that delays occur. It could be that this is a major deterrent to use of MEDLARS in clinical situations, rather than the time involved in the request-search-print-out procedure.

Scanning and Searching. The average M respondent scanned his print-out within a week of receiving it, searched for the relevant items himself and eventually scanned most of them. In these matters there did not appear to be any difference between M-SDI and M-Retro respondents. Results are shown in Tables 38 and 39 below.

	M-SDI (N=37)	M-Retro (N=40)
Within a day	12	14
Within a week	16	18
Within a fortnight	4	2
A month or more	4	3
Other	1	3

Table 38. Time lapse between receipt and scanning of MEDLARS print-out.

	M-SDI (N=37)*	M-Retro (N=40)*
Search yourself	28	26
Use assistant	6	9
Use librarian	9	12
Not search at all	3	1

Table 39. Methods of searching for items from MEDLARS print-out.

Respondents were asked in Question 39, "Can you give some estimate of the proportion of references that seemed relevant that you eventually read or scanned?" No ranges or estimates were given to be ticked as it was felt that any categorization given might influence the response. For example, a breakdown of

$\frac{1}{3}$ $\frac{2}{3}$ All

might influence people to indicate ⅔rds. Whereas

25% 50% 75% All

might influence people to indicate 75%. Or a continuum such as

0% ________ 50% ________ 100%

might influence people to indicate 50%.

However, with hind-sight the investigators suggest it would have been better to have risked influencing the response and to have compensated for that in interpreting the results rather than to have left it blank. The proportion given was expressed in such a variety of terms - "a lot"; 4/5ths; 5 out of 10; ⅔rds; 80% - that it was very difficult to tally the answers. Eventually, a rough scheme was adopted where "a lot", 4/5ths etc., were placed in the 75% or more category; ⅔rds, "quite a few" etc., were placed in the 55% to 74% category; "about half", "over a third" etc., in the 31% to 54% category and "very few", "not many", "about a third" etc., in the 30% or less category. The results of this analysis are given in

* Figures do not seem to equal N as some respondents indicated more than one category.

Table 40 below.

	M-SDI (N=37)	M-Retro (N=40)
30% or less	5	10
31% - 54%	7	7
55% - 74%	8	4
75% or more	15	10
Did not reply	2	9

Table 40. Proportion of apparently relevant items on MEDLARS print-out which were scanned by user.

That M-Retro respondents tended to eventually scan fewer apparently relevant items is understandable when one recalls that a Retrospective search will on average have a much larger number of citations than an SDI search. It would be interesting to investigate whether other factors also operate which are related to differences in the information needs of the two groups.

Acquiring the items cited. Respondents were asked to give some estimate of how readily available were relevant items from their MEDLARS print-outs. Partly in order to compare the efficacy of closed versus open forms of questioning respondents were asked to complete a grid-structure. (See Appendix VI B: Question 35 for the full results). There did not appear to be any difference in the responses of M-SDI and M-Retro samples hence the summary of the grid in Table 41 below presents figures for all respondents combined.

	Over ½	About ½	Less than ½
Immediately accessible	16	17	22
Easily accessible	10	14	23
Not easily accessible	15	8	26
Not obtainable	0	2	22

Table 41. MEDLARS users' judgements on the accessibility of relevant citations in print-outs.

It appears that all users experience some difficulty in acquiring material. Of the 55 users who found any of the material

immediately available only 16 users found most of it compared to 22 who found less than half of it to be so. A total of 49 users found some of the material to be not easily available: 15 of these finding that most of it was not easily available. It is also interesting that 24 users from a group who consider they enjoy better than average information services found some of the material completely unobtainable.

Most respondents (N=44) had not sought some relevant items because of the delays involved in acquiring them. (See Appendix VI B: Question 36). One respondent did not have easy access to a library; 11 found that the items were held in an accessible library but were unobtainable when they wanted them; and 30 felt that an inter-library loan request would take too long. 4 respondents specifically mentioned the problem of acquiring material from overseas and the problem of foreign-language material. Again it must be emphasized that these are people located close to major Australian medical libraries with established inter-library loan routines.

The investigators sought to probe the effect any shortcomings in document delivery services might have on the usefulness of MEDLARS and so Question 33 asked: "Did you find that the time it took to actually obtain the documents you wanted reduced the usefulness of the MEDLARS search for you?"

Several respondents appeared to mis-read this item and interpreted it as referring to the timeliness or up-to-dateness of the MEDLARS citations. Misapprehension is obvious in the following comments:

> "NO - I have not yet tested the usefulness of MEDLARS as far as TIME & SPEED of delivery of Information.
>
> I'll try it next time I meet a DRUG REACTION CURRENT. I use a CLINICAL CHEMISTRY BOOKLET to get some information, but not necessarily the latest."

> "NO, although a lot of the references were clearly irrelevant."

> "Recently MEDLARS has been 'up to date' - the main delay is indexing of journals in Index Medicus."

Other respondents gave somewhat equivocal answers like the following:

> "I obtained some immediately. Some I have not yet obtained but they will be useful when I do because I would not otherwise have known of their existence".

And:

> "No, but sometimes it does since most 1973 journals in the library are at the binders for at least the first 1/2 of 1974".

It is possible that others also misunderstood the question and therefore the results presented in Table 42 below should be regarded with caution: there is no way of knowing how respondents who gave a simple "yes" or "no" had read the question. Again as there was no apparent difference between M-SDI and M-Retro respondents, results have been combined.

Did you find that the time it took to actually obtain the documents you wanted reduced the usefulness of the MEDLARS search for you?

NO	YES	PARTLY	MIS-READ	DID NOT REPLY
44	18	5	5	5

Table 42. Effect on usefulness of MEDLARS search of time taken to acquire documents.

As has been noted elsewhere in this report, respondents appeared to have a low level of expectation regarding the performance of information systems. Even though the majority of them experienced some difficulty in obtaining material and did not even attempt to seek some of it because of the anticipated delays, the general tone of the comments was not critical. Only one user wrote "suggest print-out in codes where particular articles can be obtained". Others went to some effort to "apologize" for the difficulties in obtaining material. For example, regarding inter-library loan one respondent felt that not only would it take too long, but would also "be an arduous job for the librarian": he would like to see authors' addresses on the print-out so that he could contact them directly. Another, who also felt that inter-library loans would take too long, explained that: "ILL resources are limited and cause our librarian a great deal of work". Similarly another, commenting on whether the time taken to obtain documents reduced the usefulness of his MEDLARS search, wrote: "Not really as I expected and allowed for some delay", while another wrote: "Depends on availability of journals - some may have to be obtained through inter-library loan". The implication was that an inter-library loan would take considerable time, but that this was to be expected and accepted. Yet another explained apropos the delay he had experienced in obtaining documents that: "This was not due to any fault of MEDLARS but postal delays and overworked library staff having to cope with my additional requests".

And finally another respondent disclosed that: "If you want a comprehensive literature search you must be prepared to spend a great deal of time obtaining the material".

Estimates of the value of MEDLARS. The majority of respondents found that their MEDLARS searches had been of some help and roughly a quarter felt that it had helped them considerably. These responses to Question 40 are shown in Table 43 below.

	M-SDI (N=37)	M-Retro (N=40)
Help considerably	9	19
Provide some help	20	14
Marginal value	1	2
Useless	0	2
Did not reply	7	3

Table 43. Respondents' estimates of value of MEDLARS searches.

The only M-SDI respondent who had found his search of marginal value was a psychologist and he commented that "I find the odd article which I have not picked up by Current Contents, reading journals at the library or on my shelf etc." Despite only finding the odd article he continued to use the service because he found it:

"1. Particularly satisfactory to be able to check out the effectiveness of my journal coverage post hoc (i.e. printout usually too late to precede Current Contents, etc.)

2. Particularly good now that cards are available for alphabetical filing [as a] permanent record.

3. Unsatisfactory (but not MEDLARS fault) that about half my area is covered in medical journals, about half not".

One of the 2 M-Retro respondents who had found their search to be useless was also a psychologist and again the reason was that the database does not cover psychological aspects to sufficient depth. The other, specializing in surgery, found that "Limitation in data terminology has caused problems in specific field of interest - Liver physiology and metabolism". The number of relevant citations missed and non-relevant citations retrieved had seriously impaired the usefulness of previous searches and the matter had been discussed with a librarian after which the respondent had amended the search request himself.

One of the 2 M-Retro respondents who had found the search to be of marginal value was interested in veterinary rather than medical aspects. The other did not specify the subject of his search but was located in a University department of biochemistry and nutrition. He found the search unsatisfactory because it produced very few relevant citations. In the past he had found that the number of relevant citations missed and non-relevant retrieved had seriously impaired the usefulness of searches and he had himself amended his search request.

As can be seen in Table 43 more M-Retro respondents found their search to be of considerable help than did M-SDI respondents. There are a variety of possible causes for this but one cause might be that Retrospective search requests are prompted by a specific information need, for example, information related to a new research topic. Where there is a specific aim it may be that its fulfilment is more satisfying than when there is a more diffuse aim, such as, to keep up-to-date. 26 M-SDI respondents and 30 M-Retro respondents completed Question 41 asking in what way the search had been of help. Their comments differed widely and can be more clearly shown separately in Tables 44 and 45 below.

Supplied information about research done, research methods, techniques etc.	18
Provided wider search	6
Showed no relevant items missed	3
Saved time in searching the literature	3
"They solved my problem"	1

Table 44. Reasons why M-Retro respondents found MEDLARS search of value.

Brought to attention papers otherwise missed	9
Gave new ideas, techniques	6
Supplied information	4
To ensure personal searching methods are adequate	2
Other	5

Table 45: Reasons why M-SDI respondents found MEDLARS search of value.

Many M-Retro respondents had found their searches useful because they had provided information which immediately affected their work. For example, one commented:

> "They were of importance as I would otherwise have repeated certain aspects of research already carried out. This would have seriously influenced my examiners of my Ph.D. if they happened to be aware of them".

Another reported that MEDLARS had "Indicated that some areas had in fact been covered by other workers". Another comment was that "They did answer the questions asked i.e. what ways of measurement were available"; and another reported that the search "enabled assessment of techniques that had been tried by other workers in relevant fields". It would of course be splendid if all MEDLARS users could report of their searches as one respondent did: "They solved my problem".

Many M-SDI respondents appeared to find their searches useful in a more general way. This was indicated in comments such as: "Provided more complete coverage of rather scattered field of interest. Provided new information and ideas"

> "Particularly good for foreign language journals & journals not taken by N.S.W. libraries".

> "They provide new information on the subject (which I would otherwise not have known of) which was of interest or assistance. This interest or assistance was more often peripheral than crucial".

The investigations suggest that differences in estimates of the value of the two services are not due to differences in the relevance ratios, timeliness, and so on, of the print-outs, but are due rather to the fact that users of the S.D.I. service see it as one of their several information sources for general information needs.

iii MEDLARS: Comments on the Australian MEDLARS Service

Question 43, the final item of the questionnaire, invited respondents to comment on any aspects of using the MEDLARS Service that they had found particularly satisfactory or particularly unsatisfactory. 21 M-SDI and 25 M-Retro respondents made some comment, an analysis of which is given in Tables 46 and 47 below.

Satisfactory		Unsatisfactory	
Polite and prompt service	5	Search request	7
Card print-out	4	Date base coverage	2
Other	3	Other	3

Table 46. M-SDI respondents' comments on the MEDLARS Service.

Satisfactory		Unsatisfactory	
Polite and prompt service	6	Search request	5
Satisfactory in general	6	Data base coverage	4
Other	3	Other	3

Table 47. M-Retro respondents' comments on the MEDLARS

Most favourable comments were related to the timeliness of the print-out and the good liaison maintained by the staff of the Australian MEDLARS Service: this was true for both M-SDI and M-Retro respondents. Unqualified praise included comments such as: "I am amazed at the efficiency of the service".

Several comments were at once complimentary and critical. For example, one respondent wrote: "Very polite and helpful. A bit slow over-all. Good correspondence. Programming a bit loose and non critical so that a lot of irrelevant citations are listed, but I believe that this is inevitable with present Retrieval System". Another user commented: "I felt guilty at receiving so much information and not having time to digest it".

The response time of the service appeared to be quite satisfactory to respondents. This is in line with findings from other sections of the questionnaire (see pages 24 and 54) which indicate that users of medical information services are understanding rather than demanding about the time frame in which they expect information services to operate. Only one user mentioned the time-factor as a drawback. He suggested that:

> "More rapid (timewise) dialogue between analyst and myself would help. Perhaps it would be an idea to provide analysts in major medical libraries in different cities and institutions."

Several other respondents expressed a desire for contact with a qualified person. Problems in communicating search requests was the most frequently mentioned source of dissatisfaction. These have been categorized as "search request" on Tables 46 and 47: only a few of these complaints were based on dissatisfaction with interpretation of the request by the MEDLARS staff. Most of the respondents expressed dissatisfaction with the number of non-relevant references retrieved, the relevance ratio, and expressed a desire for more guidance in communicating their information needs in order to improve the relevance ratio. This desire was common to both M-SDI and M-Retro respondents. For example, one M-SDI respondent wrote:

> "The system of search specifications and use of request statement did not prove sufficiently selective. This may have been due to inexperience with the system. The result was a very large number of irrelevant references. I would like to see a much more specific request form, even if this would be longer and more complex, that would enable the MEDLARS programme to exclude irrelevant references."

An M-Retro respondent wrote:

> "I have been pleased with the quick service provided, but consider the amount of irrelevant material could be reduced by better programming - perhaps by a discussion directly with the search formulator."

Obviously a specialized data base must be accompanied by specialized servicing such as that supplied by MEDLARS search analysts. For example, one respondent dissatisfied with the number of non-relevant citations in his print-out felt that this

was partly caused by the lack of such specialized servicing, he wrote: "The librarians (UNSW) aiding the search are not familiar with specialized terminology and its usage".

The various comments of respondents to this survey some of which have been quoted above also reinforce the belief of the investigators that this servicing has to be available at the point where the search request is being communicated. One respondent commented: "I know that the search analyst HAS written to me on several occasions to ascertain my satisfaction with the results - this approach may not be quite DIRECT enough!"

A system capable of translating a search request into a sophisticated machine-searchable strategy has to be accompanied by an equally sophisticated capability to translate the prospective user's information need into an appropriate search request. That is, it requires information specialists who are familiar with the specialized language of the users' discipline, who are familiar with both the capabilities and the constraints of the system and who are also equipped with the communication skills required for any effective reference work.

It would be impossible to provide the equivalent of a MEDLARS search analyst at every service point in every library to which users of medical information have access. Comments of respondents to this survey point up, however, that more expert staff in the large medical libraries could make MEDLARS more effective and that MEDLARS is most unlikely to be integrated into any national library-based information system until better access is provided to it for all its potential users.

iv Summary of findings related to the M Sample

The following points summarize findings of the parts of the questionnaire which were distributed only to the M sample.

MEDLARS: General

i Most respondents had been using the service for between one and two years. M-SDI respondents tended to have been users for longer than M-Retro responients. M-SDI respondents were also more likely to use both the Retrospective Search and the SDI service.

ii Just over half the respondents had heard about MEDLARS through a library and roughly one third had heard from a colleague.

iii Most respondents did not discuss their search requests with a librarian. The most common reason given for this was the feeling that a librarian would not possess the necessary subject knowledge.

iv Approximately half the respondents had been inconvenienced by the number of non-relevant citations retrieved but had accepted this as an inevitable part of the system.

Their most common reactions to non-relevant citations were either to take no action or to amend the search request themselves.

v Relevance was interpreted as:

"a measure, judgement or estimate of the appropriateness, applicability or usefulness existing between the information provided and information need as judged by a user or requester".

MEDLARS: Data concerning latest search request

i Keeping up-to-date and having a wider scanning area were the most common reasons for using the SDI service. Starting a new research topic was the most common reason for using the Retrospective Search service.

Some SDI respondents appear to use the service instead of personal searching; others appear to use it as an additional method.

ii The average respondent scanned his print-out within a week of receiving it, searched for the relevant items himself and eventually obtained and scanned most of them.

iii Most respondents experienced some difficulty in obtaining apparently relevant items. Only 26 respondents found most of them easily accessible while 24 found some material not obtainable. 30 respondents had not sought some relevant items because of delays experienced or expected in obtaining inter-library loans.

iv The majority of respondents had found that their MEDLARS search had been of some help and roughly a quarter felt that it had helped them considerably.

v The turn-round time on MEDLARS searches appeared to be satisfactory to respondents. The promptness and politeness of the MEDLARS Service were the aspects found most satisfactory.

The aspect that was mentioned most as a source of dissatisfaction was the number of non-relevant citations retrieved. Respondents suggested more personal discussion in formulating search requests as one possible means of reducing the number of non-relevant citations retrieved.

Section III Conclusions and Recommendations

A. Conclusions

The data collected in this preliminary investigation suggest that: in general

i there is extensive non-use and lack of awareness of information services available to users of medical information;

ii local library services are inadequate at both the community and hospital levels to serve the needs of medical practitioners;

iii the inter-library loan network is inadequate, even as it functions in the medical libraries of the larger universities;

and in relation to MEDLARS

i non-users of MEDLARS appear likely to prefer to use the spoken rather than the written word in disseminating information and to be less literature-oriented than MEDLARS users;

ii MEDLARS could be of use to many who do not use it now, especially to those who feel the lack of a literature alerting service;

iii even among users of MEDLARS there is considerable ignorance of the capabilities and limitations of the system;

iv few MEDLARS users are able to call upon the assistance of a suitably informed librarian to assist them in using this and other information services effectively;

v a number of MEDLARS users who profess themselves satisfied with the service are not in fact using it to best effect and a number who feel some dissatisfaction do not know that the system could be made to work better for them.

B. Recommendations

The investigators recommend that:

i an investigation should be commenced immediately of ways and means by which delivery of material through the inter-library loan network could be speeded up;

ii an investigation be made of the adequacy of hospital library collections and that a minimum core collection of titles be compiled which could well be adopted as a standard by the Australian Council on Hospital Standards;

iii an investigation be made of the feasibility of providing short-term training programs for hospital librarians and other

medical librarians, of the format and content of such programs and of the bodies most appropriate to sponsor them;

iv provision should be made for the recruitment and training of field officers to disseminate information about information services available to the health care profession and to improve user access to specialized data bases;

v consideration should be given to the development of non-bibliographical information services (for example, drug information services) for the health care community and to the provision of information services in formats other than the printed word.

APPENDIX I

PROGRESS IN ASSESSING INFORMATION NEEDS OF RESEARCH WORKERS IN THE BIO-MEDICAL SCIENCES

A position paper prepared by

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INTRODUCTION

This paper arose from an initial attempt to survey the progress in assessing the information needs of research workers in the field of medicine.

A study of the literature has led me to conclude that there has been very little actual assessment of information needs.

There appears to have been an emphasis, in developed countries overseas, on supplying a variety of sophisticated information services, coupled with fairly extensive, and, granted its objectives, useful research into the extent to which these services are used, and the extent to which such use has been termed "satisfactory" by the user.

Looking at the Australian situation one can see developments in the provision of information services. However, this is not coupled with extensive research into use-patterns.

Both in Australia and overseas there appear to be two important areas in need of further researching. The first is the assessment of user needs, the second is the assessment of the necessity for user education, and for non-user education in particular.

PRESENT SERVICES

The United States has a long history of provision of information services in the field of the bio-medical sciences. Since the indexing of the books and journals in the Library of the Surgeon-General's Office, U.S. Army by John Shaw Billings in 1879 there has been a consistent attempt to provide a comprehensive coverage of the nation's bio-medical library holdings.

The following is a brief listing of the series of indexes, culminating in Index Medicus 1960 - to date. (3)

Index Medicus (The original indexing journal of that title)
- Published: 1879 - 1926
- Scope: To index, as far as possible, all current medical journals of the day.
- Method: Arranged by broad subject classifications with author and more detailed subject indexes at the end of each volume.

Terminated by combining with Q.Cumulative Index to form Q. Cumulative Index Medicus.

Index Catalogue of the Library of the Surgeon-General's Office, U.S. Army
- Published: 1880 - 1955 in five series
- Scope: Monographs and journals holdings
- Method: Originally a single alphabetical listing of author, title and specific subject headings for monographs and journal articles.

Quarterly Cumulative Index
- Published: 1916 - 1926
- Scope: To index selected medical journals
- Method: Single alphabetical listing of author and specific subject headings.

Terminated by combining with the original Index Medicus.

Quarterly Cumulative Index Medicus
- Published: 1916 - 1956
- Scope: To index a selected range of medical journals and research communications, and a classified list of new monographs
- Method: Single alphabetical listing of author and specific subject heading.

Current List of Medical Literature
Published: 1941 - 1959
Scope: To index in weekly and cumulated issues "the contents of some useful medical Journals".
Terminated in 1959 and its functions were then superseded by -

Index Medicus
Published: 1960 - to date
Scope: To index, at present, over 2,500 journals of medicine and associated disciplines
Method: Separate author and subject sections. Cumulated annual volumes.

The Library of the Surgeon-General's Office eventually became the National Library of Medicine, and in 1964, with the implementation of Medlars, it became a computer based central medical library. Medlars itself has two functions basically. One is the publication of recurring bibliographies, catalogues and indexes, for example, Index Medicus. The other is the production of demand-search bibliographies, which are sometimes done at the N.L.M., and at other times are done direct from a regional library. Since the establishment of the Australian Medlars Service at the National Library of Australia these can now be done in Australia.

The actual administrative organization of U.S. medical libraries is based largely on the Medical Library Assistance Act, 1965, under which funds for "national biomedical information networks" were allocated. The policy statement endorsed by the Board of Regents of the N.L.M. in 1971, sets out clearly how this organization is structured and where the responsibilities for the provision of information services lie. (11) Briefly, it is a hierarchial design with each higher level "acting as a backup resource to the echelon below" (11:271). The basic unit, or lowest level, includes hospital libraries, college libraries, the libraries of research organizations and so on. Their responsibility is mainly to provide adequate staff to manage their own resources, and to ensure effective communication with the resource library. The next level is the Resource Library. These are generally the libraries of medical schools. Their responsibilities include supporting the information needs of the basic units in their area, and participating in the Regional Medical Library Program by such activities as co-ordinated regional acquisitions plans. The back up facilities for these

libraries are the Regional Medical Libraries, which are responsible for planning a co-ordinated system within each region. The final level is the National Library of Medicine which is the back-up resource for the Regional Medical Libraries, and is responsible for the national co-ordination of planning.

Incidentally, Canada has a similar structure with the National Science Library of Canada, the Health Sciences Resource Centre of Canada, and the libraries of the sixteen medical schools.

Apart from the services centred round the N.L.M., other networks are being developed. For example, the New York Biomedical Network (12) where the four medical centres of the State University of New York are connected by an on-line user-orientated English language system to each other and to other centres in the State. The main data bases used are the book catalog records of the medical centres of the University, (1962 to date); the book catalog records from the N.L.M. (1966 to date); MEDLARS file (1964 to date); and records for the Union List of Serials of libraries within the State University and member libraries of the Central New York Reference and Resources Council. By using local typewriter-style terminals connected to the headquarters at SUNY Upstate Medical Centre Library at Syracuse, the user gets his "answer" within a few minutes. This consists of a list of citations which he then scans to select those which appear most relevant. He then requests the item he wants and is given its location if it is held in his library, or, if it is not held there, an inter-library loan request is automatically generated.*

There are many other networks and systems being developed and it would be pointless to attempt to enumerate them here. The point that is important is that on the whole they provide a pretty prompt and comprehensive means of access to bio-medical information.

In a closely related field, that of medical records, it is interesting to look at the studies being done in both U.S. and U.K. The British study (1:XV11) with due decorum delineates its areas of concern in the following way:

* For this system the developmental costs over three years amounted to $1,000,000, and annual running costs are estimated at $600,000.

"... medical record linkage is defined as the process of bringing together selected data of biological interest for a population commencing with conception and ending in death."

The U.S. study (5:249) has a trace of grandeur. They say:

"... For just a moment let us consider the concept of a universal Health Information Bank. Located at a convenient, centralised and well-fortified site would be a computer centre. The terminals for this centre would be located in hundreds of health centres around the country. Stored in this centre would be a health record of every citizen from the time of birth, all inclusive, and closing with the death record."

On an international level also there are widespread information services. Among the many bibliographical services, Excerpta Medica is a good example of the range of services provided and the scope of material covered (6). In 1969 the Excerpta Medica Abstracting Journals came out in thirty-three subject sections (they now number thirty-eight) covering 3,000 journals. This resulted in an approximate annual screening of 20,000 individual journal issues, or, 200,000 articles. Before processing and abstracting each issue is microfilmed; this has been done since 1960 and as at 1969 their archives contained over half a million microfiches, representing 18,000,000 pages of original articles.

The indexes and S.D.I. services are only one part of the Excerpta Medica Computer System. They can also provide copies of the original articles on magnetic tape, on microfilm/microfiche, or, in hard copy. They also offer:

"... an experienced staff of qualified medical translators [who] can provide translations of medical texts from any language into any other at nominal rates" (6:3).

Even more ambitious projects are being investigated. For example the International Council of Scientific Unions and UNESCO collaborated on a four-year study of world scientific information, and in 1970 recommended the establishment of UNISIST. This is an international body, beneath which there would be individual governmental agencies "to interlink information services

in science and techology in national networks and to provide adequate equipment and manpower for a speedy processing of scientific information ". (19:22)

To come back to reality, one can turn to the situation in Australia, and read for example, a paper by J. Lloyd on medical libraries in South Australia (10). C. Franki of the Biomedical Library, University of New South Wales, in an unpublished submission to the Committee on Medical Schools (7) presents a clear analysis of the short-comings and needs of medical libraries. He starts by making the point that information needs in the field of medicine will continue expanding as medical knowledge continues to grow. This will need an expansion of undergraduate medical courses, and the development of continuing education programmes for medical practitioners. Furthermore, more medical schools, and hence medical libraries, will be required if the present medical manpower shortage is to be remedied: this situation will become critical if the Australian population continues expanding.

He then draws attention to five main areas of concern. First, the collections which are often inadequate already and the generally high cost of medical books, plus the necessity for keeping up-to-date with the frequent new editions, make the availability of more funds essential. Then there are accommodation shortages, both insufficient study place and insufficient shelf space. Thirdly, there are staff shortages and this often leads to short hours of opening and/or staffing by persons who are not fully au fait with the collection and therefore cannot give the best service. Another problem is the absence of any formal training in medical librarianship.

The fifth area of concern is that of the use of university medical libraries as resource libraries, without any formal recognition of their function in this capacity. For example, in the U.S.,as I have already mentioned, a resource library is recognized as such and special funds are allocated so that it can properly fulfill its function. In Australia there is no such provision and yet these libraries carry a heavy burden. The interlibrary loan statistics for Jan. 1st - April 10th 1973 at the Biomedical Library, University of New South Wales, demonstrate this. In this period it handled 2178 requests from its five associated teaching hospitals, plus 1146 from other sources.

Apart from showing the burden thrown on the providing library, I think these figures are also interesting from another angle. The requests received are already "filtered", in the sense that location has generally been verified in Scientific Serials in Australian Libraries: thus the total amount of interlibrary loan need from the associated teaching hospitals is in fact much greater than these figures alone indicate. And this brings one back to the first area of concern mentioned - the general paucity of collections

The conclusion of the Submission is that medical libraries are at present inadequate in fulfilling their role in medical education and research, and that this situation will become worse. There is a need to investigate the general provision of medical information in Australia, and to plan to establish a biomedical communication network. Specifically there is a need for a recognition of the special needs of university medical libraries; for more funds and training of staff; for financial support for the resource or regional libraries of the network; for the establishment of a central medical library to act as the ultimate resource library for medical information in Australia, and to co-ordinate the activities of a national bio-medical communications network.

I agree that there is a need to investigate the general provision of information services in Australia, and there is a need to rationalize the various medical libraries into a more organized and supportive system. But, I also feel that it will be most unfortunate if this is done without a parallel investigation of actual information needs. Two things lead me to consider this most important. One is that there seems to be increasing discontent with the services overseas, which, as I have already indicated, appear to be relatively comprehensive and efficient. The other is that existing services in Australia appear to be under-used: and here, I think, enters the important element of user-education.

At the third International Congress of Medical Librarianship in Amsterdam, 1969, the representative from the National Lending Library for Science and Technology made some interesting points. He said that an analysis of requests had shown that about ten times as many were more suitable to a manual search, than to a Medlars search, and furthermore, that in 1969 they expected to do only 3,200 machine searches. He added, "It will be a long time before a computer can give the answer more cheaply than Index Medicus." (8:139) Another point he emphasized was the extent of rivalry and over-lapping between the various competing systems. At the ISLIC International Conference on Information Science at Tel-Aviv, 1971 the same point was the topic of a paper on "Competition or Co-operation", (2:27-32), in the field of scientific and technological information which emphasized the need for improved co-ordination within and among systems. This paper also raised the topic of user-education and said what ought to be studied was, "How can effective educational programmes be developed so that users, operators and producers can effectively use these complicated and expensive tools". (2:32)

This "conflict" between existing systems is shown clearly in the case of Medlars and Excerpta Medica. They both cover much ground in common but they do not have compatible indexing terms. Medlars uses MeSH, whilst Excerpta Medica has developed its own system, the EMCO-index and MALIMET, the corresponding thesaurus, which is controlled by MALICHECK, the Master Check List Computer Program (6).

Even where there is no "conflict" the extent of overlap is still important. For example, the Biomedical Library of the University of New South Wales subscribes to approximately 200 indexes: this is costly both in money and shelf-space. If the overlap were total one could simply select the one wanted, but unfortunately it is only partial. For example, Index Medicus, Chemical Abstracts, Biological Abstracts, Excerpta Medica's thirty-eight separate indexes, etc. all over-lap in areas and yet also contain unique information.

The very bulk and number of information channels available are confusing enough for any user, but apart from this there is the problem of the mass of citations in any given index. This brings one back to the whole problem of the recall-relevance ratio. An interesting paper by R.B. Tabor (16) expresses this point very aptly. He says:

> " Many ... specialists need fast and efficient methods of information retrieval ... systems such as MEDLARS are becoming increasingly less useful since the volume of scientific literature is so great and since this retrieval system provides no index as to the quality or relevance of a particular article. Moreover, the time required to check each item of the long list of references may be inordinate for anything other than a very detailed review. It is probable that the multiple uses of a library and information service for specific problems encountered in medical practice can never be met by the MEDLARS-type system and that a more relevant solution would be for speciality groups to provide a weekly or monthly input to a library and information service for articles and other information of particular importance." (16:151)

From general conversation with librarians and users of medical indexes, etc., the above statement seems to apply to Australia. An especial problem that we face is that our collections

hold relatively few of the citations received. Admittedly, through Medlars one can receive hard copy within a few weeks, but there is a delay and a clerical procedure involved which must be frustrating to the user.

At the Congress in Amsterdam which I have mentioned, the W.H.O. representative said:

> " ... before we can establish medical information centres and systems we have to have medical libraries, well stocked, efficient, functioning medical libraries, providing a full range of services to their users". (9:413)

According to the criteria adopted by the Congress, Australia falls into the category of an under-developed country with poor medical library resources. Perhaps we should concentrate our limited resources on the more mundane topics of adequate collections, staffing and space, before branching out into expensive, complicated, computerized information retrieval systems.

I say "perhaps", because we really do not know. This brings me back to my main concern: the need to assess information needs, and the need to assess the necessity for user-education. Are services such as Medlars and Excerpta Medica relatively under-used, because in fact they are not offering something that is wanted? Or, does the problem lie in the lack of general knowledge of the availability of such services? Or, do they appear intimidatingly complex to use?

One small area which if investigated might help to answer such questions is the Landline Network. This is a service run by the Post-Graduate Committee in Medicine, based at the University of Sydney, by means of which the teaching hospitals are connected by telephone so that talks, conferences, etc., held at one place can be received at the others. This appears to be working successfully between the hospitals. Also, the talks are recorded and tapes or cassettes can be borrowed, and at present they lend between 150 - 180 per month. The service is roughly ten years old. The point that I find interesting is that general practitioners, medical students, researchers and so on can also be connected by installing another telephone line in their home or surgery. Cost might be a factor, but I have found a surprising lack of awareness among medical researchers, practitioners and students of even the existence of the service, let alone any knowledge of the cost of it. I emphasize that this is only a general impression acquired by general conversation: unfortunately there are no studies to either confirm or invalidate my opinion.

A survey done in Toronto on physician self-education patterns (18) came up with some surprising results. It covered interns and residents from fourteen hospitals and medical institutions in the Metropolitan Toronto area and had a 37.1% response rate, i.e. 390 returns from a population of 1,098. They found that of the 63% reported as not using Excerpta Medica, 21% had never even heard of it (18:40); and over 50% had never received instruction in the use of Index Medicus (18:41). They conclude "The fact that 90 per cent of the respondents used their hospital library as either a primary or secondary source of information, while only ten per cent had received instruction in the use of a medical library, speaks for more instruction being needed". (18:43).

The Annual Review of Information Science and Technology, in an article on "Information Science Applications in Medicine" (4:325 - 357) emphasizes the need for user-education especially in the computerized services. "Services that provide user-orientated search and S.D.I. services ... typically require a continuing interchange between user and searcher ... Automation in medical information systems will require education of the user to achieve appropriate man-machine system balance." (4:328)

The necessity for assessing information needs and for user-education has long been recognized, but unfortunately little appears to have been done. As far back as 1966 A.M. Rees was writing in the Medical Library Association's Bulletin:

> "Assessment of the needs of users of medical libraries and information systems must, in fact, be made in relation to the observed behaviour and experience of biomedical scientists".(14:99)

and

> "It is anticipated that experimentation will eventually result in a methodology which will permit the determination and prediction of the information needs of any identified group of users in a specific environment". (14:99)

However, a scanning reveals that / the so-called "user-need-studies" written-up in that Bulletin, do not exactly fulfill his expectations. Most of them are surveys of the state of present use of an existing collection or service. For example, the study by Raisig et al "How Biomedical Investigators use Library Books" (13:104-7) Analyses the crude circulation figures of Yale Medical Library for the period 19th March - 14th August, 1964 and comes up with relatively unhelpful facts such as that 30.4% of the items borrowed were monographs, and that nearly 4/5ths were published in the last decade.

In a 1969 issue of the Medical Library Association Bulletin, there is a large four-week survey carried out by Wood and Bower on the literature borrowed from the National Lending Library for Science and Technology (17:47-63). They find out that 62% of their loans go to Universities and industrial organizations; that the most commonly used type of literature consists of English language periodicals published since 1960. And they find that the main sources of reference are citation lists in periodical articles, but that for literature published in the last 15 months abstracting and indexing journals are more frequently used.

Studies such as this one are interesting and they provide useful information, and we certainly need this type of survey done here. But, as well, and perhaps even more necessary both here and overseas, are actual studies of information needs, not just information use.

I see the recommendation of the Scientific and Technological Information Services Enquiry Committee, presented in their Report Vol.I (15), for the establishment of a national scientific and technological information authority as a timely development. It is pleasing to note that they specify that one of the functions of the Authority, should be:

> " to promote education in the use of scientific and technological library and information services." (15:XIII)

Should the Authority be established it may concern itself with some of the problems I have raised in this paper, and perhaps lead towards a solution of them.

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APPENDIX II

TRENDS IN INFORMATION SERVICES

A digest of information obtained from the literature is presented in this Appendix. The investigators appreciate that people directly involved in the provision of medical information services are likely to be aware of the services described. This Appendix is intended for those not so directly involved who may find such a compendium useful as a survey of recent trends in the provision of medical information services.

The major information service in medicine in the United States is that provided under the terms of the Medical Library Assistance Act, 1965, which authorized funds for a national biomedical communications network. The National Library of Medicine acts as the ultimate resource library and administers the provisions of the Act and has formulated the Regional Medical Library Program (RMLP). (60)

The RMLP is basically a four-level hierarchical structure designed to provide a framework within which biomedical information sources in each region can be organized into a supportive and co-operative system: federal financial support is given to institutions willing and able to assume services additional to those previously and normally provided to their users. (66: 274) The first two National Library of Medicine services to be decentralised have been Inter-Library Loan and MEDLARS.

At present there are eleven Regions each having a Regional Medical Library responsible for Inter-Library Loans in that area and a Regional MEDLARS Center sometimes situated in the Regional Medical Library and sometimes at another location. The physician population (as at 1969) ranged from 9,279 in Region X - Pacific Northwest, to 49,552 in Region II - New York, with the average size being between 21,000 and 28,000. (83: 54-55)

In the various RMLP developments there are emergent trends worth considering in relation to the possible development of Australian medical information services. These are:

1 - the emphasis on document delivery services,

2 - the amount of finance, publicity and field contact required to make potential users aware of services,

3 - the development of new services to satisfy needs not met by bibliographical library orientated services, such as MEDLARS.

New England RMLP

The first Region to become operational (on 10 January, 1967) was the New England area - Region I. The Francis A. Countway Library of Medicine was designated the Regional Medical Library and is responsible for Inter-Library Loans in the area and acts as the MEDLARS Center. A grant of $104,872 was given, "to plan, develop, and commence operating on a limited scale the Regional Medical Library for the six New England states". (27: 329) The biomedical holdings of the Library at that time were approximately 425,000 monograph titles and 5,200 current periodical subscriptions. The physician population, in 1969, was 21,268.

A Regional Advisory Committee was formed to give advice on planning for the future and they report:

"The Countway planners of NERMLS and its Advisory Committee feel strongly that the heart of the Regional Medical Library program consists of the strengthening of library resources and services at the local level. Therefore, during the initial planning year, a scheme for accomplishing this was developed. Briefly it consists of the provision of Regional Library Consultants who can respond to expressed needs in the Region and, indeed, generate expressions of needs not yet articulated. These Consultants will advise administrators, librarians and health professionals both at home and in the field, on how to go about providing for their library needs .... This important consultation service is to be supported by efficient back-up loans of library materials from the Countway Library to augment local collections ...." (27: 334-5)

In the first year efforts were concentrated on providing the "efficient back-up loans", or Document Delivery Service (D.D.S.). Between October 1967 and June 1968 the Library handled 27,022 requests and claims to have completed 75% within 48 hours. In the year July 1968 to June 1969 over 40,000 requests were received. NERMLS attribute part of this success to the fact that with RMLP funds they were able to use first-class airmail for all items despite the cost; to provide free photo-copies; to use WATS channels (i.e. toll-free long distance telephone lines) for incoming requests free-of-charge to the user. Other factors in their success were that they insisted on the use of A.L.A. interlibrary loan forms; only accepted requests outside of the Region if they were accompanied by a declaration that the resources of the requestor's Region and the National Library of Medicine had already been tried; and refused to handle requests with inadequate citations from "libraries of substance". However, from small libraries they would accept such requests and try to verify them because "The desire to help a less fortunate neighbour is a positive action; as opposed to a negative posture of intellectual snobbery". (271 : 331)

In other words NERMLS had a general plan and selected a specific goal and they devoted their grant to achieving it. NERMLS was publicized at the New England Hospital Assembly, at the Annual Meeting of the Massachusetts Medical Society, at the World Health Assembly and elsewhere.

In April 1968 NERMLS decided to use some of the RMLP funds in collaboration with the Post-Graduate Medical Institute (PMI) a body sponsored by the Massachusetts Medical Society. Again, a specific goal was selected - namely, consultation services to hospital libraries. The PMI had already initiated a survey of educational needs of hospitals in New England and had established a project "to create a small physician-selected core library of books and journals designed to act as a device for self-education in the community hospital and to form a nucleus, or minimum standard collection, for a local hospital library" (28 :321) The PMI staff were used as the Regional Library Consultants and are reported as having been "particularly effective in making appropriate contacts and in the persuasion of administrators of the importance of hospital library service" (28 : 322). Again, the project was widely publicized. About 100 hospitals were visited by both PMI and NERMLS staff and eventually about 40 hospitals agreed to establish the core library and to send trainees to Training Institutes organized by NERMLS. N.S. Stearns, Executive-Director of PMI commented that "We believe strongly that a collection without a person to stimulate interest in its use will not be

used" (75 : 197). The result, it was claimed, was 40 "flourishing libraries" receiving advice and encouragement from the visits of PMI and NERMLS representatives. NERMLS has continued its policy of developing the Basic Unit, or, hospital libraries. Training Institutes continue to be held both to train personnel in library practice and to explain the role of the hospital library within the framework of the Biomedical Communications Network (62). For example, the twelfth such Institute was held on March 18-22, 1974.

AIM/TWX at the University of Virginia

Emphasis on DDS, field contact and publicity are the most salient features of the inception of NERMLS. These features recur in other RMLP's. The AIM/TWX service at the University of Virginia was also accompanied by a document delivery service and involved considerable finance and publicity. Originally the trial period was to be from 7-20 December, 1970, during which time the Library was allowed access for 4 hours daily Monday to Friday to Abridged Index Medicus on-line. In preparation for this trial period printed information was sent to all hospitals and press-releases were prepared. Four librarians, two professional and two sub-professional, were especially trained to run the searches. VAMIS (Virginia Medical Information System) was utilized to provide "the framework for the rapid delivery of free photocopies of articles". (59 : 572)

The results were found to be successful. Over the first 19 days 114 users requested 298 searches and an evaluation done between April 1971 and January 1972 found that 57% of the citations were judged "most useful". VAMIS found that a "recurring theme in some of the positive responses was the speed with which the searches could be run and the currency of the data". (59 :572) In 1971 MEDLINE was adopted.

One interesting aspect of the original AIM/TWX trial was that 44% of the users were G.P.'s. A similar experiment at the University of Newcastle - upon - Tyne (34)was also accompanied by considerable publicity at hospitals and also secured a higher than normal rate of MEDLARS data use by hospital staff. This perhaps suggests that previous non-users once they are aware of the resources of the MEDLARS data base in fact discover that it is appropriate to their needs.

Cancer Information Service

Another example of the staff, equipment and effort required to achieve even a small degree of "consumer acceptance" is the Cancer Information Service of the Washington/Alaska RMP (Region X - Pacific Northwest) (5). This was established on an experimental basis to provide a free service in the Central Washington area using AIM/TWX. The trial period was from 1 October to 31 December, 1970 for a physician population of 240 with approximately one third of these being G.P.'s. All physicians received publicity material which among other things guaranteed three free photocopies within 24 hours of receipt of request for information. Staff seconded to the Service consisted of one Reference Librarian and two MEDLARS Search Analysts : arrangements were also made for the advice of a medical specialist in the field to be available should it be required. In the trial period 27 physicians made 56 requests at an estimated cost of $17.85 per request, excluding AIM/TWX computer-time costs.

G. Oppenheimer of the Pacific Northwest Regional Health Sciences Library commenting on the development of the PNRHSL services in general writes:

> "Our publicity effort consisted of several mailings ... This literature was sent to every physician in the region, every hospital administrator, every state health department, all health-related and major other libraries, and all members of the Pacific Northwest Group of the Medical Library Association. It consisted of editorials and articles in local medical journals and newspapers, of appearances before annual conventions of state medical associations and other professional groups. We occupied booths at some of these meetings. The yield of this effort, we must conclude, has been low. Perhaps not lower than any other such publicity campaign, but low enough to convince us that field contact is absolutely indispensable." (63 : 241)

<u>Health Sciences Information Service</u>

The growing emphasis on field contact and non-bibliographical services can be seen in the development of what later became the Health Sciences Information Service at the University of Kentucky. (Region V - East Central). This was originally sponsored in 1970 by the Ohio Valley Regional MedicalProgram which installed an In-WATS toll-free line at the University upon which the Medical Library Extension Service then assumed responsibility for all reference and document delivery services to health professionals throughout the OVRMP area. They report that "With the installation of the In-WATS line, the first move was the publicity for the program, beginning the 'hardsell' strategy promoting medical library services." (51 : 312).

Material consisted of an "announcement flyer", a Drug Information Centre brochure, an announcement describing Abridged Index Medicus, and a brochure prepared by the Library. All this information was mailed to <u>all</u> physicians, dentists, pharmacists, hospital administrators, hospital librarians, nursing directors, State and County Health Departments and Divisions. There were three full-time and three part-time staff members deployed to provide among other services consultation services for hospital libraries. The program also worked jointly with the Drug Information Center to provide an <u>information</u> service, as distinct from a bibliographical service: information could be supplied on drug indications and contra-indications, toxicity, dosage, interactions and reactions, and drug abuse.

In the trial period between April and December 1970 approximately 1500 users (out of 10,000 potential patrons) made 2,046 calls. In January 1971 the official title,Health Sciences Information Service, was adopted and another In-WATS line added to the service.

<u>Physician's Referral Letter Bibliographic Service</u>

The VAMIS network referred to earlier operates primarily through funds granted through the RMP. It aims to provide medical library services "to the State's practising health professionals" (45 : 422). As well as bibliographical and reference services it also provides consultation visits to hospital libraries and workshops and on-site consultation for training hospital librarians. One of the more unusual

services it has provided was developed through direct consultation with medical bodies. (Cf the collaboration of NERMLS with PMI discussed above). The "referral letter bibliographical service" (operational since October, 1971) was jointly devised by the staff of the Medical College of Virginia (MCV) and VAMIS representatives. (45 : 422). Briefly, the service operates in the following way: a copy of the MCV consultant's referral-letter is sent to the VAMIS centre* where a librarian selects an average of 3 references relevant to the case.ø These are sent to the consultant and if within 5 days he does not inform the VAMIS centre that they are inappropriate then a copy is forwarded to the physician who had originally referred the patient, along with the offer of free photo-copies.

Obviously, such a scheme raises problems concerning the ethics of the confidentiality in a doctor/patient relationship, as well as problems "in interpretation of the physicians' language". (45 : 422). In an attempt to evaluate the service in April 1972 questionnaires were sent to 123 referring physicians. 61 responded and of these 90% "thought the service was a good idea and wanted to continue receiving it" (45 : 424). The conclusion of the VAMIS report is that "the service holds interesting possibilities for the future shape of medical information delivery and marks a new point of contact between medical literature, medical librarians, and medical practitioners". (45 : 425).

Medical Information Service via Telephone

Some other interesting new developments in providing medical information have been (like the VAMIS scheme) developed by, or in association with, medical bodies. MIST (Medical Information Service via Telephone) was developed by the Division of Continuing Medical Education of the University of Alabama School of Medicine and its primary purpose "is to improve patient care by providing an immediate person-to-person consultative service to practitioners of Alabama from the faculty of the University of Alabama School of Medicine". (35 : 263). Basically, the scheme involves the servicing of existing informal channels of communication: practitioners in the area often telephoned the Medical Center for advice but they were also often not sure who the best person to speak to was, whether he was free at the time and so on. The result was "delay, confusion, fraying of tempers, and many times complete frustration" (35 : 257), hence it was decided to make specific plans for a telephone service.

In-coming and out-going WATS lines are utilized and callers reach the MIST operator on a toll-free number. An operator with sufficient medical knowledge to channel calls is on duty from 8am to 5pm, five days per week and Faculty are available on a structured on-call schedule. When appropriate, relevant literature is sent to the caller within three days" ... as an immediate educational reinforcement at a time of particular interest" (35 : 263). Out of hours calls are banked by the hospital switchboard unless it is an emergency.

* There are two centres: one at the Medical College of Virginia at Richmond and another at the University of Virginia, School of Medicine at Charlottesville.

ø SUNY searches are run if manual searching proves unsatisfactory.

The 6-month pilot project, funded jointly by AMA-ERF funds and the Alabama RMP (Region VI-Southeastern), was designed to service four counties and a letter was sent to every physician describing the service and inviting participation. Descriptions of the service and news items were also included in State medical journals. The reponse to the service was such that in the first month (July, 1969) 62 calls were received from 17 other counties as well as 19 from the four specified areas.

Analysis of the first nine months of operation (July, 1969 to March 1970) showed that 480 practitioners (approximately 20% of the practising physicians of Alabama) made 1,521 calls to 152 Faculty members. They also found that the service was not abused as some had feared it might be. For example, practitioners were not using the service unfairly in lieu of referring patients and hence jeopardizing the consultative services of practising specialists, nor was the service used for non-medical calls and similar possibilities.

The success of MIST is such that the University of Alabama School of Medicine is developing plans for other telephone services, for example, the telephone transmission of electrocardiograms and of carotid pulse tracings. They also aim at purchasing the Dial-Access-Library developed at the University of Wisconsin.

Medical Communications Center

The Medical Dial-Access Library of the University of Wisconsin (Region VII - Midwest) is part of the Medical Communications Center developed by the University of Wisconsin Medical Center and University Extension.* (54) It was established in September 1967 with the over-all assumption that more important than the form in which information is presented is the fact that it be presented at the time that the user is motivated to seek it. They attempt to present "pertinent, current and authoritative information" (54 :338) by means of the Telephone/Radio Conference, the Medical Single Concept Film, and the Dial-Access Library.

The Telephone/Radio Conference started in November 1965 and it aimed to make lectures and discussions from the University faculty available to off-campus physicians by means of a telephone circuit linking hospitals to the University. Initially, there were 18 stations giving 13,000 hours of instruction in 1965/66; by 1967/68 with more stations approximately 80,000 hours of instruction were transmitted. An attempt to evaluate the effectiveness of the information so transmitted was done by comparing the performance of a group of physicians from 11 linked hospitals and a matched group of medical students on a pre-test and post-test after both groups had covered the same material. There were no significant differences found between them.

The Medical Single Concept Film was developed with three specific objectives:

1 - to present new procedures "that are quite simple when viewed but seem very complex when described in a text" (54 : 340)

2 - to avoid the normal complications of arranging projectors, screens etc. generally associated with film viewing;

*The project has had the support of participating physicians, United Health Foundations, Wisconsin RMP, and the National Fund for Medical Education. (54 : 342)

3 - to make the films short since "most medical films run twenty to fifty minutes, which a physician can rarely afford." (54 : 340).

The Medical Center developed short films of 6-10 minutes' duration containing only essential information. They supply a cartridge-loading projector and the films are self-rewinding.

The Medical Dial-Access Library also operates on a principle of minimum user effort. Self-rewinding, 5-minute long tapes are available 24 hours a day on a toll-free line. They aim to contain core information that is:

i) of an emergency nature, for example, one of the most requested tapes is "Emergency Treatment of Cardiac Arrhythmias";

ii) of recent discovery, for example, another frequently requested tape is "RH Negative Pregnant Patient (Latest Trends in Management)"; or

iii) difficult to find elsewhere. Perhaps "Marriage on the Rocks" the third most requested tape enters this category.

An evaluation of the service showed that from January 1968 to March 1969 approximately 14 calls per day were received and suggests that it is a service "with appeal to general practitioners who are comparatively isolated from ready consultation and who have less time to utilize more established lines of reference" (54 : 339). By October 1969 the number of calls was approximately 10 per day at an approximate annual cost of $18,000.

Dial Access Tape Libraries.

Dial Access Tape libraries feature in several RMP's. For example, (again in Region VII - Midwest) the Minnesota Medical Information System (MMIS) which is partly subsidized by RMP funds provides not only the normal reference, DDS, MEDLARS and MEDLINE services but also a Dial Access Tape service and a Drug Information service. Again, users contact the service on a toll-free number (67).

One unusual Dial Access Tape service is one developed by the San Bernardino County Medical Society - "Tel-Med". (23) In the pilot year commencing in October 1971 they aimed to make approximately 50 tapes with the help of $24,500 from RMP funds, $10,500 from the California Medical Education Research Foundation and the Society itself providing $11,000. They started operating in April 1972 with 35 tapes approximately 3-6 minutes long containing medical information on topics such as early signs of pregnancy, V.D. etc. Access is through a toll-free call available to everyone and manned from 9am to 8pm on week-days and 10am to 6pm on Saturdays with 10 lines. Tapes can be requested by index number, title or subject, and are available in both Spanish and English.* A member of the Society writes that "Emphasis is primarily on prevention or early

*Just by way of contrast the Post-Graduate Committee in Medicine, University of Sydney's Tape and cassette loan service has no subject index for users at all - and only an obsolete discontinued one (originally devised by a medical practitioner) for the staff handling the service.

detection and only secondarily on treatment. Sources of further information on how to obtain diagnosis and treatment are provided when pertinent. Moreover, the information bears the approval of their own county medical society. The public relations value to physicians is immeasureable." (23 : 68) According to the Society in the first 14 weeks of service they received nearly 16,000 calls and other medical societies, for example, the San Diego County Medical Society have been prompted to develop similar schemes.

Such services are a long way from the traditional concept of library service, but, it is interesting that the National Library of Medicine saw fit to grant $24.500 of RMP funds towards development of "Tel-Med".

Non-bibliographic services.

A number of professional bodies are engaged in the development of similar information services, which though they may make use of library resources, including in some cases MEDLARS search services, are not affiliated with any particular library institution. As such they are beyond the area of this Report, however, it is worth noting some of them as they do suggest the trend towards information services as opposed to bibliographical services. (64 ; 65)

The Michigan Drug Information Network is concerned with collecting analyzing and then disseminating to physicians within the State of Michigan information on drug therapy, utilization and adverse reactions. In particular it is concerned to reduce the time lag between developments in drug therapy and their practical application to patient care. The Network is centred at the University of Michigan Hospital with ten subcenters throughout the State: access is by telephone 24 hours per day.

The Reticuloendothelial Society (U.S.A.) is working on the development of "a semantic information retrieval system, in sharp contrast with document retrieval" (18 : 352). This will involve not only the compression of knowledge by the construction of unambiguous "semantically dense" (18 : 358) abstracts, but also, the abstractor will be "an evaluator of the scientific merits of the publication" (18 : 363). Basically, the aim is for sufficient information to be put into a computerized data-base to make it unnecessary to consult the original publication.

The Psychopharmacology Research Branch (NIMH) has since 1967 been developing the Early Clinical Drug Evaluation Units (ECDEU) data-base. (42 ; 49) Again, sufficient information is entered so that the enquirer, (who enjoys on-line access), can obtain information in answer to questions such as "Has drug A been compared to drug B in schizophrenic patients?" (42 : 6) The data-base consists of detailed accounts of experimental drug studies, for example the name(s) of drug(s) and comparison drug(s), their chemical structure, whether a single drug or combination drug; details of population studied, for example, in-patient, chronic; details of dosage administration, for example, capsule or parenteral, number of milligrams, whether a fixed or flexible dosage and so on.

The Forensic Science Society (U.K.) has developed an S.D.I. service for its Regional Forensic Science Laboratories. (11) The core of the service consists of journal articles, papers from the Regional Laboratories and so on stored in microform on fiche or film. It also has "Fairly straightforward collections ... for example, boot and shoe impressions" (11 : 156) as well as less "straightforward" collections of ultraviolet and infrared curves: in 1969 they held a collection of 55,000 curves centrally and a core collection of 3,000 curves is located at each Regional Laboratory.*

This digest of medical information is by no means comprehensive. It is however meant to suggest that the bases of thinking about the future of medical information services in Australia can be broad and varied and that much can be learned from the accumulated experience represented in the services described.

*To explain the nature of ultraviolet and infrared curves a member of the Society writes: "To the non-scientist, let me say that these are methods of identification involving the comparison of instrumentally drawn curves from the unknown substance with a standard collection of known compounds. (11 : 157)

APPENDIX III

Covering letter

THE UNIVERSITY OF NEW SOUTH WALES
P.O. BOX 1, KENSINGTON, N.S.W. 2033
Telegraphic Address: UNITECH, SYDNEY

59

TELEPHONE: 663 0351
Ext. 2907
PLEASE QUOTE
CM/SM

School of Librarianship

8th July, 1974

Dear

Enclosed is a questionnaire by which we are attempting to ascertain some of the types of information and information services needed by the medical profession.

Considerable activity is currently taking place in the planning of medical information services and therefore it is urgent to find out now not only your needs but your ideas on the type of service which would be appropriate for you.

This survey is being conducted under a grant from the National Library of Australia and is intended as a preliminary to an Australia wide examination of medical information and library services. Your co-operation is requested as we believe that any reorganization of present services, and any provision of new services, will inevitably suffer if imposed from without rather than being developed in accordance with the actual needs, preferences and practical constraints of time and location of the prospective user. We can only gather this necessary data by asking you, as a representative of your profession, to complete this comprehensive questionnaire.

Naturally, your individual answers will be held in the strictest confidence. While there is no need for you to identify yourself, if you care to do so, either on the questionnaire or on the pre-addressed reply envelope, we will be glad to report to you the results of this survey.

We look forward to receiving your answer to the questionnaire, and we should be very grateful if you would return it as soon as possible.

Yours sincerely,

Carmel Mag...

Carmel Maguire,
SENIOR LECTURER

Eugenia Lovelace

Eugenia Lovelace,
RESEARCH ASSISTANT.

APPENDIX IV

Reminder letter

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THE UNIVERSITY OF NEW SOUTH WALES

P.O. BOX 1 • KENSINGTON • N.S.W. • AUSTRALIA • 2033
TELEPHONE 663 0351
EXTN.

PLEASE QUOTE

School of Librarianship,

27th July, 1974

REMINDER LETTER

Dear Sir,

Pilot Survey - Medical Information

If you have not already returned our questionnaire, we would be very grateful if you would complete it and return it to us as soon as possible.

If it has been misplaced, please phone 662-2907, and we will be pleased to send another one.

If you have already returned the questionnaire anonymously, thank you very much.

Yours sincerely,

Carmel Maguire

Carmel Maguire,
SENIOR LECTURER

Eugenia Lovelace

Eugenia Lovelace,
RESEARCH ASSISTANT.

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APPENDIX V

Letter sent by the Australian MEDLARS Service
to MEDLARS users in New South Wales

55

National Library of Australia

Canberra ACT 2600 Telephone 621111
Telegraphic Code Address: Natlibaust Canberra
Telex Code No. 62100

ref:

date: 30 MAY 1974

Dear

The National Library has funded a research project which may be the preliminary to a full-scale survey of medical information needs in Australia. In this preliminary project the researchers, Miss Carmel Maguire and Miss Eugenia Lovelace of the School of Librarianship at the University of New South Wales, would like to contact a number of people who have used MEDLARS.

May I have your permission to disclose your name and address to the researchers so that they may contact you in order to discuss the MEDLARS service? It would be very helpful if you could let me have your answer to this request as soon as possible and by June 15th at the latest.

Yours faithfully,

Paul Hodgson
Australian MEDLARS Service

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APPENDIX VI A

Questionnaire distributed to Non-M sample
and their responses (N=37)

53

UNIVERSITY OF NEW SOUTH WALES

PILOT SURVEY - Medical Information

Distributed July 1974

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1. Would you rate the information services available to you as:

Excellent	5
Above average	8
Adequate	14
Less than adequate	7
Poor	1

Did not reply 2

52

2. In which of the following environments do you *mainly* exercise your professional skills? *(Please tick one or more as appropriate)*

General Practice	16
Hospital	16
Government Department (*for example, Federal Health Dept., State Health Commission, etc.*)	5
Armed Forces	2
Research Institute, Laboratory (*for example, Walter and Eliza Hall Institute of Medical Research, C.S.I.R.O., etc.*)	3
Private company	1
Specialist Private Practice	11
University or other tertiary institution	5
Other (*Please specify*)	2

*3.A Can you rank the following activities according to the amount of time you generally devote to them. *(Please rank: 1=rarely; 2=some; 3=often; 4=a lot)*

	Rarely	Some	Often	A lot	Total
Administration	4	5	5	2	16
Direct patient care	0	0	2	16	18
Research	10	2	1	0	13
Teaching	3	8	5	0	16
Other (*Please specify*)	4				

....

* 20 respondents returned this version.

50

*3.B Can you estimate the amount of time per week that you generally spend on the following activities: *(Please tick one or more as appropriate)*

	Less than 15 hrs per week	15-30 hrs per week	Over 30 hrs per week	Total
Honorary hospital work	7	3	1	11
Non-resident salaried hospital work	0	0	2	2
Resident hospital work	0	0	1	1
General Practice (group)	0	1	6	7
General Practice (individual)	0	1	0	1
Specialist Practice (group)	0	1	1	2
Specialist Practice (individual)	2	1	3	6
Clinical teaching and research	6	0	0	6
Non-clinical teaching	4	0	0	4
Non-clinical research	1	1	0	2
Government and Public Service	3	1	1	5
Other medical work	5	0	1	6
Administration	6	1	1	8

* 17 respondents returned this version.

4. In which of the following areas do you need information:
(Please rank: 1=rarely; 2=sometimes; 3=often; 4=a lot)

A. Information directly related to <u>immediate</u> patient care, *for example, contraindications in drug therapy, applications of hyperalimentation, etc.*

Rarely	Some.	Often	A lot	Total
3	14	8	8	33

B. Information related to the administration of health care, *for example, medical records, social services provisions, etc.*

11	18	2	3	34

C. Information for your general awareness of current developments in your field, *for example, recent advances in thyroid studies, changing concepts in coronary care, etc.*

1	14	10	12	37

D. Information for teaching purposes

11	15	4	1	31

E. Information for your own research, *for papers, articles, monographs, etc.*

12	9	4	2	27

Other *(Please specify)* ....

			4	4

5. When you need information in the area(s) you have indicated above do you: (*Please rank: 1=rarely; 2=sometimes; 3=often; 4=a lot*)

	A. Immediate patient care				B. Health care Administration				C. General Awareness				D. Teaching				E. Research				Total
	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	
Use a non-print information service, *for example, borrow a tape or cassette containing relevant information.*	10	5	0	1	11	1	0	0	5	4	6	2	10	3	0	0	11	0	1	0	70
Use a library	5	4	3	6	8	3	2	1	7	7	2	4	8	5	3	5	8	3	3	3	93
Use an assistant to find the information for you	14	4	0	1	9	2	4	1	10	2	0	0	10	3	0	1	10	3	1	1	76
Consult a librarian	14	4	2	0	14	0	1	0	16	1	1	0	14	1	0	0	15	1	2	1	85
Attend case presentations, talks, informal meetings, etc.	8	11	5	3	8	4	0	1	2	12	9	0	10	2	0	1	9	1	1	2	89
Attend conferences, formal seminars, etc.	5	9	5	3	10	2	1	1	3	12	4	2	10	2	1	1	3	3	1	3	86
Talk to your colleagues	2	8	7	14	6	5	6	4	1	4	14	5	6	6	5	1	5	3	4	3	109
Use pharmaceutical companies' information services	7	14	1	5	11	1	1	0	6	9	1	3	12	1	0	0	10	0	1	1	84
Use a literature service, *for example, a regularly supplied list of authors and titles of articles in your field, or a service that alerts you to items in the literature that are likely to be of interest to you*	15	1	2	1	9	1	0	1	9	5	1	0	9	1	0	1	9	0	1	2	68
Use your personal collection of files, journals etc.	1	14	4	11	8	4	2	3	16	4	1	2	3	3	4	4	6	3	4	3	105
Other (*Please specify*) ...4......																					4

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6. Could you name the professional journals that you've been able to find time to look at in the last month?

Nº of journals	Nº of respondents	Nº of journals	Nº of respondents
0	3	7	1
1	3	8	2
2	3	9	0
3	6	10	1
4	4	11	1
5	8	12	0
6	4	13	1

7. Which abstracting and indexing journals have you consulted in the last month? (Please list)

Nº of abstracting and indexing journals	Nº of respondents
0	20
1	7
2	5
3	5

8. Could you please give the name(s) of any formal conferences etc. you have attended in the last month?

Nº of conferences	Nº of respondents	Nº of conferences	Nº of respondents
0	21	7	0
1	8	8	0
2	2	9	1
3	4	10	0
4	0	11	0
5	0	12	1
6	0		

9. Can you recall the number and the topics of any seminars, talks, case-presentations etc. that you have been able to attend in the last month?

Nº of seminars etc.	Nº of respondents*	Nº of seminars etc.	Nº of respondents
0	20	6	0
1	4	7	0
2	2	8	1
3	3	9	1
4	2	10	1
5	2		

* 1 respondent replied "Yes, of course!"

10. In the last two years have you had any articles, letters, book-reviews etc. published in scientific journals?

YES	NO
11	26

If YES would you please list the journal titles:

No. of titles listed	No. of respondents
1	4
2	2
3	2
4	2
5	0
6	1

11. In the last two years have you acted as an editor, or been asked for advice on the suitability of papers submitted to scientific journals, presented at conferences etc.

YES	NO
10	27

12. In the last two years have you delivered any papers at professional meetings?

YES	NO
12	25

13. In the last two years have you given talks, lectures etc. at an organization other than your own?

YES	NO
20	17

14. In the last two years have you given talks, presented cases etc. to fellow-professionals in your own organization?

YES	NO
21	16

Of which professional associations are you a member? (Please list)

No. of memberships	No. of respondents	No. of membership	No. of respondents
0	4	6	3
1	7	7	2
2	6	8	1
3	8	9	1
4	2	10	0
5	2	11	1

15. The following are examples of some of the information services available in medicine:

A. Tape and cassette loan-services of the Post-Graduate Committees in Medicine of the various universities.

B. Radio broadcast services of the Post-Graduate Committees in Medicine of the various universities.

C. Land Line Network of the Post-Graduate Committee in Medicine (University of Sydney).

D. MEDLARS.

E. Other computerized information services, for example, BA Previews, I.S.I. services etc.

Would you please tick, as appropriate, the amount of use you make of them on the following grid:

	A Tape & cassette loan-services	B Radio broadcast services	C Land Line Network	D MEDLARS	E Other computerized services
Never use	22	27	32	26	30
Rarely use	6	5	3	5	2
Sometimes use	4	5	0	2	1
Often use	1	0	0	0	0
Use a lot	3	0	0	0	0

Comments: ....

16. Has your use or non-use of these services been influenced by any of the following factors? (*Please tick as appropriate*)

	A Tape & cassette loan-services	B Radio broadcast services	C Land Line Network	D MEDLARS	E Other computerized services
Lack of publicity about what the service offers and how you get to use it.	11	9	10	16	18
You feel the service would not be of any use to you.	9	12	12	8	8
You feel that the time taken between contacting the service and receiving the information would be too long.	0	0	0	1	0
The service is inconvenient to use.	10	8	8	3	4

17. If you would like to, please comment on any other services you use or any other factors that influence your use or non-use of information services ....

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18. Have you ever received any formal training in methods of searching for scientific information?

(*Please tick as appropriate*) YES: 2 NO: 35

19. Can you recall the last time that you had to have information that required a deliberate search? Was it within the last:

(Please tick as appropriate)

Day	1
Week	11
Month	8
6 Months	12
Year	3
Longer	0
Cannot recall	2

20. What kind of information were you seeking? *for example, a particular technique related to patient care, information on health services in other countries, etc.*

Direct patient care: unspecified .... 15 ..... Cannot recall 2
Drug information .... 7 ..... Did not reply 1
Anaesthetics .... 2 ....
Editorial preparation .... 2 ....
Surgical technique .... 2 ....
Other .... 6 ....

21. Did you use the services of someone else to find the information?

(Please tick as appropriate)

YES	NO
2	35

*22. A <u>If you searched for it yourself</u> could you please describe how you went about doing so.

....

Consulted a library 6

Consulted own collection 6

Used MEDLARS 2

Used medical book supplier 1

....

* 17 respondents returned this version of Questions 22A and 23A. 2 respondents had used the services of an assistant.

25.A Can you give any recent example of information, of whatever kind, which you tried and failed to obtain?

....

..Did not reply.......... 7 ....

..No........................ 7 ....

..Yes....................... 3 ....

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39

*22.B <u>If you searched for it yourself</u> did you already know <u>where</u> to find it? (*Please tick as appropriate*)

YES	NO
18	2

a) If <u>NO</u>, how did you go about finding out where to start?

......Asked..a..medical...librarian......1............

......Consulted..a..basic...text.........1............

....

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b) Where did you <u>start</u> looking for it?

Consulted.own.collection...7....Consulted.a.colleague...2....

Consulted..a...library....4....Non-medical..search.....1....

Consulted.drug.company...2....Cannot..recall........2....

Did not reply 2

c) Could you mark on the following scales how much information you found and how much time and effort it involved:

All information found — Sufficient information found — Insufficient information found

0 (7) ... 3 ... 5 (9) ... 1 ... 1 ... 10 (1)

Little time taken — Moderate — Time consuming

0 (5) ... 2 ... 5 (6) ... 1 ... 2 ... 10

Little effort involved — Some effort involved — A lot of effort involved

0 (5) ... 2 ... 1 ... 5 (4) ... 1 ... 10

* 20 respondents returned this version of Questions 22 B and 23 B.

d) If you had not found enough information where did you next try to find it?

Consulted own collection ... 3 ... Consulted drug company ... 1 ..

Consulted a library ... 1 ....

Consulted a colleague ... 1 ....

e) Could you again indicate the result and the time and effort involved:

All information found — Sufficient information found — Insufficient information found

0 ... / ... 5 ... / ... / ... 10

Little time taken — Moderate — Time consuming

0 ... 2 ... 5 ... / ... 10

Little effort involved — Some effort involved — A lot of effort involved

0 ... / ... 5 / ... / ... 10

f) If you still wanted more information, where did you look and how did you finally acquire it?

......."Gave up" ..... 1 ....

..... Did not reply ..... 19 ....

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*g) Could you again indicate the result and the time and effort involved:

All information found	Sufficient information found	Insufficient information found
0	5	10

Little time taken	Moderate	Time consuming
0	5	10

Little effort involved	Some effort involved	A lot of effort involved
0	5	10

h) Do you feel that more information would have been of use if you could have found it?

..Did not reply ... 11 .... Undecided ... 1 ....

..Yes .... 4 ....

...No .... 4 ....

23. Do you feel that the time involved in finding the information caused you to be satisfied with less than you would ideally have liked?

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* No respondents completed this item.

24. Can you suggest any services, facilities etc., which would have made searching easier and more convenient for you? Are there any general comments you would care to make on searching for and obtaining information?

.....Comment.........21...

.....Did not reply.....16.......................................

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25. We are interested in examining any differences that may occur in the provision of information services between city and country environments. In order to analyze returned questionnaires according to these categories, we would be grateful if you would give the postcode of the area(s) where you mostly exercise your professional skills.

Postcode(s): ....

This information will in no way infringe on the anonymity of this questionnaire should you wish to remain anonymous. However, if you care to fill in the following details we will be glad to report to you the results of this survey.

Name: ....

Address: ....

....

....

Thank you

27 respondents supplied their names.

10 respondents remained anonymous.

34 respondents supplied their postcode(s).

APPENDIX VI B

Questionnaire distributed to M Sample

and their responses

M-SDI (N=37) and M-Retro (N=40)

UNIVERSITY OF NEW SOUTH WALES

PILOT SURVEY - Medical Information

Distributed July 1974

1. Would you rate the information services available to you as:

	Total	SDI	Retro
Excellent	14	8	6
Above average	27	14	13
Adequate	27	11	16
Less than adequate	7	2	5
Poor	1	1	0
Did not reply	1	1	0

2. In which of the following environments do you mainly exercise your professional skills? *(Please tick one or more as appropriate)*

	Total	SDI	[illegible]
General Practice	1	1	0
Hospital	34	13	21
Government Department *(for example, Federal Health Dept., State Health Commission, etc.)*....................	11	6	5
Armed Forces	1	1	0
Research Institute, Laboratory *(for example, Walter and Eliza Hall Institute of Medical Research, C.S.I.R.O., etc.)*	18	7	11
Private company	1	0	1
Specialist Private Practice	6	1	5
University or other tertiary institution	36	23	13
Other *(Please specify)*	4	4	0

*3.A Can you rank the following activities according to the amount of time you generally devote to them. *(Please rank: 1=rarely; 2=some; 3=often; 4=a lot)*

	Rarely	Some	Often	A lot	Tot
Administration	10	8	8	3	29
Direct patient care	8	8	3	4	23
Research	2	7	8	20	37
Teaching	7	10	10	5	32
Other *(Please specify)*	5				

....

* 37 SDI respondents returned this version.

*3.B Can you estimate the amount of time per week that you generally spend on the following activities: *(Please tick one or more as appropriate)*

	Less than 15 hrs per week	15-30 hrs per week	Over 30 hrs per week	Total
Honorary hospital work	7	3	0	10
Non-resident salaried hospital work	2	0	5	7
Resident hospital work	1	2	6	9
General Practice (group)	0	0	0	0
General Practice (individual)	1	0	0	1
Specialist Practice (group)	0	0	1	1
Specialist Practice (individual)	4	0	2	6
Clinical teaching and research	13	6	11	30
Non-clinical teaching	7	1	1	9
Non-clinical research	1.	5	5	11
Government and Public Service	1	3	1	5
Other medical work	3	0	0	3
Administration	11	2	0	13

* 40 Retro respondents returned this version.

4. In which of the following areas do you need information:
(Please rank: 1=rarely; 2=sometimes; 3=often; 4=a lot)

A. Information directly related to <u>immediate</u> patient care, *for example, contraindications in drug therapy, applications of hyperalimentation, etc.*

	Rarely	Sometimes	Often	A lot	Total	M Total
SDI	8	8	5	2	23	53
Retro	10	11	5	4	30	

B. Information related to the administration of health care, *for example, medical records, social services provisions, etc.*

	Rarely	Sometimes	Often	A lot	Total	M Total
SDI	16	2	3	0	21	48
Retro	22	3	2	0	27	

C. Information for your general awareness of current developments in your field, *for example, recent advances in thyroid studies, changing concepts in coronary care, etc.*

	Rarely	Sometimes	Often	A lot	Total	M Total
SDI	3	8	8	14	33	70
Retro	1	9	13	14	37	

D. Information for teaching purposes

	Rarely	Sometimes	Often	A lot	Total	M Total
SDI	9	9	7	4	29	63
Retro	4	10	14	6	34	

E. Information for your own research, *for papers, articles, monographs, etc.*

	Rarely	Sometimes	Often	A lot	Total	M Total
SDI	2	3	6	26	37	76
Retro	0	4	10	25	39	

Other *(Please specify)* ....

	Total	M Total
SDI	2	5
Retro	3	

5. When you need information in the area(s) you have indicated above do you: *(Please rank: 1=rarely; 2=sometimes; 3=often; 4=a lot)*

		A. Immediate patient care				B. Health care Administration				C. General Awareness				D. Teaching				E. Research					M Total
		Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Rarely	Sometimes	Often	A lot	Total	
Use a non-print information service, for example, borrow a tape or cassette containing relevant information.	SDI	9	1	0	0	11	0	1	0	13	0	1	0	11	1	1	0	14	1	0	1	66	132
	Rehab	[illegible]	2	0	0	11	0	0	0	12	3	0	0	12	5	1	0	15	1	0	0	66	
Use a library	SDI	5	7	2	3	11	1	3	3	5	2	8	13	10	5	2	8	2	2	10	20	[illegible]	256
	Rehab	1	5	4	7	11	2	1	1	5	5	8	14	3	7	3	13	0	2	12	22	131	
Use an assistant to find the information for you	SDI	10	2	1	0	10	1	1	0	14	1	1	0	12	2	0	1	15	5	1	0	77	159
	Rehab	12	2	1	0	11	1	0	0	13	1	1	0	15	3	0	1	16	5	4	2	82	
Consult a librarian	SDI	9	4	1	1	9	3	1	0	8	5	4	0	6	8	2	1	6	14	4	3	94	196
	Rehab	[illegible]	6	1	0	11	3	0	0	9	7	2	0	13	8	1	1	7	20	6	4	102	
Attend case presentations, talks, informal meetings, etc.	SDI	6	4	4	3	10	1	2	1	5	6	5	3	6	6	4	1	6	8	6	3	90	194
	Rehab	0	2	7	9	10	3	0	0	1	11	10	4	5	10	4	3	4	10	10	2	104	
Attend conferences, formal seminars, etc.	SDI	7	3	3	2	9	2	3	0	7	10	5	2	8	3	2	4	6	16	8	7	105	219
	Rehab	3	7	5	1	11	2	0	0	5	15	9	1	7	11	4	1	4	15	9	4	114	
Talk to your colleagues	SDI	1	5	7	5	6	4	3	3	3	2	12	8	4	6	4	5	4	4	14	10	110	237
	Rehab	1	2	6	10	7	8	0	3	1	6	16	6	3	9	13	3	1	12	11	9	127	
Use pharmaceutical companies' information services	SDI	11	3	2	0	12	0	0	0	11	3	2	0	12	2	1	0	14	0	1	1	75	155
	Rehab	8	3	1	0	9	0	1	0	9	7	1	1	13	3	1	0	13	3	1	1	80	
Use a literature service, for *example, a regularly supplied list of authors and titles of articles in your field, or a service that alerts you to items in the literature that are likely to be of interest to you*	SDI	9	2	1	2	9	1	1	2	7	3	6	4	6	4	2	3	3	8	8	13	94	192
	Rehab	6	5	2	2	11	1	0	0	8	5	7	2	10	5	5	1	7	4	6	11	98	
Use your personal collection of files, journals etc.	SDI	4	2	9	3	9	0	4	2	4	6	10	5	5	7	7	10	2	7	12	14	121	237
	Rehab	1	3	12	4	8	1	3	1	5	4	8	5	4	7	7	13	5	8	7	16	[illegible]	
Other (*Please specify*)	SDI																					0	0
	Rehab																					0	

28

*6. Could you name the professional journals that you've been able to find time to look at in the last month?

N° of journals	N° of respondents SDI	Refs	N° Total	N° of journals	N° of respondents SDI	Refs	N° Total
1	3	0	3	9	1	2	3
2	2	1	3	10	0	3	3
3	4	2	6	11	3	1	4
4	2	4	6	12	0	2	2
5	3	3	6	13	2	3	5
6	1	4	5	14	0	5	5
7	8	6	14	15	1	0	1
8	6	2	8	16	0	1	1

7. Which abstracting and indexing journals have you consulted in the last month? (Please list)

N° of abstracting and indexing journals	N° of respondents SDI	Refs	N° Total	N° of abstracting and indexing journals	N° of respondents SDI	Refs	N° Total
0	7	9	16	5	0	0	0
1	11	13	24	6	0	1	1
2	7	9	16	7	0	0	0
3	6	5	11	8	0	0	0
4	6	2	8	9	0	1	1

* 2 respondents did not name any journal titles, but claimed to scan 30 and 60 titles respectively.

27

8. Could you please give the name(s) of any formal conferences etc. you have attended in the last month?

No. of Conferences	No. of Respondents SDI	Retro	M. Total
0	27	25	52
1	8	11	19
2	1	4	5
3	0	0	0
4	1	0	1

9. Can you recall the number and the topics of any seminars, talks, case-presentations etc. that you have been able to attend in the last month?

No. of Seminars etc.	No. of Respondents SDI	Retro	M. Total	No. of Seminars	No. of Respondents SDI	Retro	M. Total	No. of Seminars etc.	No. of Respondents SDI	Retro	M. Total
0	10	8	18	6	5	2	7	12	1	0	1
1	3	2	5	7	2	1	3	13	0	0	0
2	4	5	9	8	2	2	4	14	0	0	0
3	4	2	6	9	0	1	1	15	0	1	1
4	4	7	11	10	1	2	3	16	0	0	0
5	1	5	6	11	0	1	1	17	0	1	1

10. In the last two years have you had any articles, letters, book-reviews etc. published in scientific journals?

	YES		NO		Did not reply		
	SDI / Retro	M Total	SDI / Retro	M Total	SDI	Retro	M Total
	29 / [illegible]	61	6 / [illegible]	14	2	0	2

* If YES would you please list the journal titles:

Nº of titles listed	Nº of Respondents SDI	Retro	M Total	Nº of titles listed	Nº of Respondents SDI	Retro	M Total
1	5	10	15	6	2	0	2
2	3	7	10	7	2	1	3
3	5	7	12	8	1	1	2
4	6	3	9	9	1	1	2
5	2	1	3	10	0	1	1

11. In the last two years have you acted as an editor, or been asked for advice on the suitability of papers submitted to scientific journals, presented at conferences etc.

	YES		NO		Did not reply		
	SDI / Retro	M Total	SDI / Retro	M Total	SDI	Retro	M Total
	20 / 14	34	11 / 25	41	1	1	2

12. In the last two years have you delivered any papers at professional meetings?

	YES		NO		Did not reply		
	SDI / Retro	M Total	SDI / Retro	M Total	SDI	Retro	M Total
	25 / [illegible]	54	11 / 11	22	1	0	1

13. In the last two years have you given talks, lectures etc. at an organization other than your own?

	YES		NO		Did not reply		
	SDI / Retro	M Total	SDI / Retro	M Total	SDI	Retro	M Total
	25 / [illegible]	55	9 / [illegible]	18	1	0	1

14. In the last two years have you given talks, presented cases etc. to fellow-professionals in your own organization?

	YES		NO		Did not reply		
	SDI / Retro	M Total	SDI / Retro	M Total	SDI	Retro	M Total
	31 / 35	66	5 / 5	10	1	0	[illegible]

Of which professional associations are you a member? (Please list)

Nº of associations	Nº of respondents SDI	Retro	M Total	Nº of associations	Nº of respondents SDI	Retro	M Total
0	4	1	5	5	2	3	5
1	7	7	14	6	1	2	3
2	7	9	16	7	1	0	1
3	9	9	18	8	0	3	3
4	6	6	12				

* 2 respondents indicated "yes" but did not list the journal titles.

25

15. The following are examples of some of the information services available in medicine:

A. Tape and cassette loan-services of the Post-Graduate Committees in Medicine of the various universities.

B. Radio broadcast services of the Post-Graduate Committees in Medicine of the various universities.

C. Land Line Network of the Post-Graduate Committee in Medicine (University of Sydney).

D. MEDLARS.

E. Other computerized information services, for example, BA Previews, I.S.I. services etc.

Would you please tick, as appropriate, the amount of use you make of them on the following grid:

	A Tape & cassette loan-services		B Radio broadcast services		C Land Line Network		D MEDLARS		E Other computerized services	
	SDI	Retro	SDI	Retro	SDI	Retro	SDI	Retro	SDI	Retro
Never use	28	29	31	35	29	35	0	0	22	27
Rarely use	1	7	0	3	2	3	4	8	3	5
Sometimes use	2	1	1	0	0	0	11	24	2	2
Often use	0	1	0	0	0	0	10	5	1	1
Use a lot	0	1	0	0	0	0	11	2	3	0

Comments: ....

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16. Has your use or non-use of these services been influenced by any of the following factors? (*Please tick as appropriate*)

	A Tape & cassette loan-services		B Radio broadcast services		C Land Line Network		D MEDLARS		E Other computerized services	
	SDI	Relev	SDI	Relev	SDI	Relev	SDI	Relev	SDI	Relev
Lack of publicity about what the service offers and how you get to use it.	15	22	12	15	11	15	3	2	15	27
You feel the service would not be of any use to you.	10	8	10	14	12	13	0	0	3	1
You feel that the time taken between contacting the service and receiving the information would be too long.	2	0	1	2	0	2	2	1	0	0
The service is inconvenient to use.	3	6	6	4	5	7	0	0	0	0

17. If you would like to, please comment on any other services you use or any other factors that influence your use or non-use of information services ....

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18. Have you ever received any formal training in methods of searching for scientific information?

(*Please tick as appropriate*)

	YES		NO		Did not reply		
		Total		Total	SDI	Relev	[illegible]
SDI	9	14	27	62	1	0	1
Relev	5		35				

23

19.* Can you give any recent example of information, of whatever kind, which you tried and failed to obtain?

Did not reply 33

No 15

Failure to obtain known references } 20

Failure to obtain information on a subject } 7

Failure to obtain translations } 4

* Some respondents gave more than one example.

20. Can you suggest any services, facilities etc., which would have made searching easier and more convenient to you? Are there any general comments you would care to make on searching for and obtaining information?

.....Comment 34.....

.....Did not reply 33.....

21

21. For approximately how long have you been using the MEDLARS service?

(Please tick as appropriate)

	SDI	Retro	M Total
6 months or less	6	9	15
6 months - 1 year	6	6	12
1-2 years	14	17	31
More than two years	10	7	17
Did not reply	1	1	2

22. How, or through whom, did you first hear about the service?

	SDI	Retro	M Total
Librarian	19	22	41
Colleague	12	14	26
Other	2	3	5
Did not reply	4	1	5

23. At present do you: (Please tick as appropriate)

	SDI	Retro	M Total
Use the retrospective search service only	* 2	27	29
Use the current awareness search service only	9	1 *	10
Use both services	24	8	32
Not use either service	1	4	5
Did not reply	1	0	1

24. Do you generally discuss your search formulations with a librarian or information officer? (Please tick as appropriate)

	SDI	Retro	M Total
YES	14	18	32
NO	22	21	43
Did not reply	1	1	2

* These inconsistencies occurred because in some cases where the person to whom the questionnaire was addressed was absent or unable to complete it, it was passed on to another person in the organization.

25. If NO is this because: (*Please tick as appropriate*)

	SPI	Retro	M Total
You feel that discussion is unnecessary	8	5	13
There is no librarian or information officer conveniently available	3	6	9
You feel that a librarian or information officer would not possess the subject knowledge necessary to assist you	12	12	24
You prefer to deal directly with a search analyst	3	4	7

Other: (*Please specify*) ....

....

....

26. Statistics on the MEDLARS Service show that generally searches will produce some citations that are not relevant to your request and will miss some citations which are relevant. In your personal experience has this: (*Please tick as appropriate*)

	SPI	Retro	M Total
Seriously impaired the usefulness of the search	4	4	8
Caused some inconvenience but you accept it as an inevitable part of the system	11	21	32
Not inconvenienced you unduly	19	15	34
Did not reply	3	0	3

Other (*Please specify*) ....

....

....

27. If this has inconvenienced you have you:
(Please tick as appropriate)

	SDI	Retro	M Total
Discussed the matter with a librarian or information officer	1	5	6
Discussed the matter with the MEDLARS Centre	6	3	9
Yourself amended your search formulation	6	9	15
Not taken any action	8	9	17
Ceased to use MEDLARS	0	1	1

Other: *(Please specify)* ....

....

....

From: SARACEVIC, T. "The Concept of Relevance" in his Introduction to Information Science. New York, Bowker, 1970. p.121. 18

- 17 -

28. Could you indicate, by ticking the appropriate terms on the following diagram, what "relevance" means to you.

Relevance is a:

.1. measure
... degree
... extent
... quantity
... dimension
.2. judgement
.3. estimate
... appraisal
... relation

1 respondent added "quality"

Of the:

... utility
... importance
... matching
... informativeness
.1. appropriateness
... satisfaction
... connection
... fit
... similarity
.2. applicability
... closeness
.3. usefulness
... bearing

Existing between a:

... document
... document representation
... references
... textual form
... fact
.1. information provided

And a:

... question
... question representation
... research stage
.1. information need
... point of view
... use of orientation
... treatment

As judged by a:

.2. requester
... intermediary
... expert
... librarian
... information specialist
... delegate
.1. user
... person
... judge

1 respondent added "me"

The consensus of opinion was that: "Relevance is a measure, judgement or estimate of the appropriateness, applicability or usefulness existing between the information provided and an information need as judged by a user or requester.

17

29. There are differences in the way the MEDLARS Service is provided at the various universities and since we would like to explore any effect of these differences if you are a member of a university would you please name it. This information will in no way infringe on the anonymity of this questionnaire should you wish to remain anonymous.

Name of university:

	University of Sydney		University of New South Wales		Other
SDI	17	SDI	5	SDI	0
Retro	15	Retro	7	Retro	2

30. Can you recall the last time you received a list of citations from an SDI or from a Retrospective Search. Can you briefly explain the reason for your submitting your request, *for example, starting on a new research topic, you wanted references on an infrequently encountered therapeutic technique etc.* φ

	SDI	Retro	M Total
Starting new research topic	0	23	23
Ongoing research topic	4	3	7
To keep up to date	7	0	7
For broader scanning	8	0	8
Other	5	12	17
Did not reply	13	2	15

31.* Did the results of the Search reach you in time for you to use it as you had intended? *(Please tick as appropriate)*

YES [37] NO [1] Did not reply [2]

If NO was it useless or did you put it to some other use?

........Did not reply 3........

....

....

32. How soon did you find the time to scan the list of citations? *(Please tick as appropriate)*

	SDI	Retro	Total
Within a day	12	14	26
Within a week	16	18	34
Within a fortnight	4	2	6
A month or more	4	3	7

Other: *(Please specify)* ....4.......

φ Last sentence only applied to M-Retro.

* This question was sent only to users of the Retrospective Search Service.

33. Did you: *(Please tick as appropriate)*

	SDI	Adhoc	M (total)
Search for the relevant articles yourself	28	26	54
Use an assistant's services	6	9	15
Use a librarian's services	9	12	21
Not search for any of the articles	3	1	4

Other: *(Please specify)* ....

....

....

34. Did you find that the time it took to actually obtain the documents you wanted reduced the usefulness of the MEDLARS search for you? *(Please comment)*

NO	YES	PARTLY	QUESTION MISREAD	DID NOT REPLY
44	18	5	5	5

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....

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35. Can you estimate the proportion of relevant articles that were: *(Please tick as appropriate)*

	Most			About			About			Less than		
	SDI	Adhoc	M (total)	SDI	Adhoc	M (total)	SDI	Adhoc	M (total)	SDI	Adhoc	M (total)
Immediately accessible	2	6	8	3	5	8	10	7	17	10	12	22
Easily accessible, for example, within one day of request	1	2	3	5	2	7	8	6	14	14	9	23
Not easily accessible, for example, available within 1-6 weeks through inter-library-loan	6	3	9	2	4	6	2	6	8	14	12	26
Not available	0	0	0	0	0	0	1	1	2	10	12	22

36. Were there any articles that seemed relevant but that you eventually did not seek because you felt that it would have taken too long to get them? (*Please tick as appropriate*)

		SDI	Retro	M Total
YES	A lot	0	3	3
	Some	3	7	10
	A few	16	15	31
NO		16	13	29
Did not reply		2	2	4

36a. If YES was this because: (*Please tick as appropriate*)

	SDI	Retro	M Total
You do not have easy access to a library	0	1	1
The articles were in an accessible library but unobtainable at the time you wanted them	6	5	11
You felt that an inter-library-loan request would take too long	11	19	30
Did not reply	2	0	2

Other: (*Please specify*) ....

....

....

37. Was the proportion of relevant to non-relevant citations acceptable? (*Please comment*)

YES			NO			DID NOT REPLY		
SDI	Retro	M Total	SDI	Retro	M Total	SDI	Retro	M Total
30	32	62	4	7	11	3	1	4

38. Would you have preferred to scan fewer references even if this meant that other relevant references would also be omitted? (*Please comment*)

NO			YES			DID NOT REPLY		
SDI	Retro	M Total	SDI	Retro	M Total	SDI	Retro	M Total
32	34	66	2	3	5	3	3	6

39. Can you give some estimate of the proportion of references that seemed relevant that you eventually read or scanned?

	SDI	Retro	Total
30% or less	5	10	15
31 - 54%	7	7	14
55 - 74%	8	4	12
75% or more	15	10	25
Did not reply	2	9	11

40. In the light of your reason for submitting the request did the new references examined: *(Please tick as appropriate)*

	SDI	Retro	Total
Help you considerably	9	19	28
Provide some help	20	14	34
Prove to be of marginal value	1	2	3
Prove to be useless	0	2	2
Did not reply	7	3	10

41. If they were of any help can you state briefly in what way they were of help?

SDI		Retro	
Brought to attention papers otherwise missed	9	Supplied information about research done, research methods etc	18
Supplied new ideas and techniques, etc	6	Provided a wider search than possible by personal searching	6
Supplied information	4	Assured that no relevant items had been missed	3
Assured that personal searching was adequate	2	Saved time in searching the literature	3
Other	5	"They solved my problem"	1

42. If you are no longer a user of the ~~Retrospective Search~~ service or SDI Service could you briefly give the reason(s) for this?

SDI		Retro	
Going overseas	1	Subject areas not well covered	2
		Other	2

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13

43. Are there any aspects of using the MEDLARS services that you have found particularly satisfactory, or particularly unsatisfactory? (*Please comment*)

........Comment 51..

........Did not reply 26....................................

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44. We are interested in examining any differences that may occur in the provision of information services between city and country environments. In order to analyse returned questionnaires according to these categories, we would be grateful if you would give the postcode of the area(s) where you mostly exercise your professional skills.

Postcode(s): ....

This information will in no way infringe on the anonymity of this questionnaire should you wish to remain anonymous. However, if you care to fill in the following details we will be glad to report to you the results of this survey.

Name: ....

Address: ....

....

....

Thank you

69 respondents supplied their names
8 respondents remained anonymous
73 respondents supplied their postcode(s)

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